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AMSTRAD Computer User



SAVAGE
The making of a mega game

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Machine code sound programming

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New rom board

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The official magazine for all users of the Amstrad CPC series

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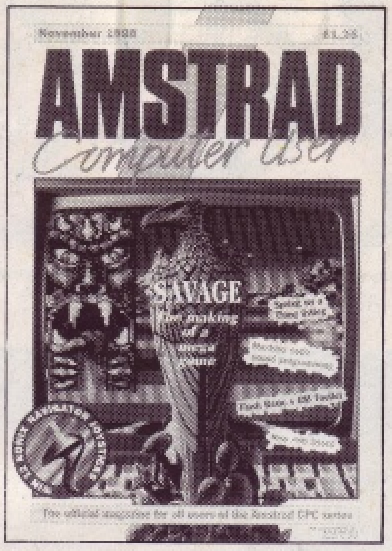

THE ARCADE COMPILATION
OF THE YEAR
TAITO®
COIN-OP
Hits
RASTAN
LEGEND OF KAGE
FLYING SHARK
ARKANOID REVENGE OF DOH
SLAP FIGHT
BUBBLE BOBBLE
ARKANOID
RENEGADE
© TAITO CORP. 1987
RASTAN The Warrior King. Lands that produce men of legend, dragon slayers, lie in his shadow – guardians of evil fear his fire spewing sword, the axe he wields as swift as lightning. State of the art programming makes a true simulation of the Arcade for your home micro, enjoy superb graphics and realistic action as RASTAN takes on a world of dangers – magical wizards, fire breathing lions, bats, snakes, skeletons and finally the living dead. Is it more than you can handle?
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AMSTRAD Computer User

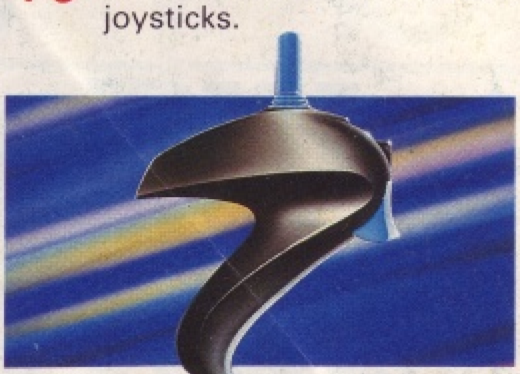
The official magazine for Amstrad CPC users

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Will the Olympics come to Manchester?

WE WILL!

The countdown has begun for the gold medalist of computer shows to return to Manchester's prestigious G-MEX centre.

Amstrad and more than 70 other exhibitors will be displaying the latest products for you to try before you buy. And with hundreds of special show offers available, every visitor could end up a financial winner.

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- Visit the 100-seat Amstrad Theatre.
- Take part in a Question and Answer session with Amstrad's own experts.
- Hear from the leading journalists who cover the Amstrad scene at the *Meet-the-Editors* forum.

Amstrad Advice

Seeking technical help with your machine?

Drop in at the new Amstrad Advice stand manned by experts on the CPC, PCW and PC machines.

The Northern

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It's a brand new show feature area, specially constructed for this event.

Take a stroll down the street and see the varied ways in which Amstrad machines are playing a major role behind the scenes in the current northern boom.

You'll be able to see living tableaux, ranging from the *Amstrad Arms* – our answer to the Rover's Return – to *Amstrad Office*. . . revealing why Amstrad machines are providing the competitive edge.

All in all, *Amstrad Street* will prove an unforgettable experience.

How to get to the show

Driving? G-MEX is in the city centre – only one mile mile from the M602 – with ample parking space available.

It is also within easy reach of Victoria and Piccadilly railway stations and Chorlton Street bus station.

Advance ticket order

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DATABASE EXHIBITIONS

A578

NEWS
Computer User

New life for Arnold

AMSTRAD plans to launch a big TV advertising campaign this Christmas to boost sales of the CPC.

One of the highlights shown here in this exclusive *Amstrad Computer User* photograph, is the new Amstrad Entertainment Centre – a completely self-contained system that consists of computer, colour monitor, TV tuner, clock radio, work desk, joystick and 17 free games.

With the clock radio, the first product Amstrad has had made in China, you can tune into your choice of radio station and use the computer at the same time. The TV tuner stacks between the monitor and radio: Unplug the leads from the computer, plug in the tuner, and watch the CPC advert on ITV.

Among the free games not shown in our photo are such classics as Scrabble and Trivial Pursuit. To complete the package there is a stylish dark grey work desk, which neatly accommodates the whole system.

Both 464 and 6128 versions of the Amstrad Entertainment Centre will be available, each with a colour monitor, priced at £399 and £499.



The Amstrad Entertainment Centre

Language of adventure

THE forthcoming adventure creator rom from Graduate Software is to be named Adlan, which stands for Adventure Language.

Written by Richard Brooksby, a past contributor of letters and short listings to *ACU*, Adlan will be supplied on a 16k rom with a disc of related programs and files.

The program will not be menu driven: It is a new language that can be edited using any word processor, text editor, or even Basic REM statements. The source code is then compiled to disc to produce a standalone machine code adventure, and is marketable as such.

Adlan will incorporate Picgen, its own graphics editor, but will also be compatible with Art Studio and the like. User-defined character sets will also be supported – indeed two will be supplied.

Roger Bamkin of Graduate Software told *ACU*: "At the moment we are having a few teething problems getting Adlan to be compatible with another program, but we are still hoping to have it ready for Christmas." Adlan will cost £29.95.

You can count on Protext

THOMPSON Computers has released the Simple Accounts Routine for use with the full CP/M Plus version of Protext on the CPC6128.

Specifically designed for the small business, Simple Accounts Routine keeps a record of your current bank balance as well as details about credit, debit, standing orders and Vat. The package costs £16.50.

Further details from Thompson Computers, 8 Hyholmes, Bretton, Peterborough, PE3 8LG.

New release roundup

● Elite Systems has fought off challenges from Domark, Gremlin, Prism and Telecomsoft to acquire the programming licence for **A Question of Sport**, the BBC TV quiz series hosted by David Coleman.

The computer game will contain all the features that have made the television programme so popular, including "The Picture Board", "What Happened Next" and "Home and Away".

● Following the success of Joe Blade, Players Software has released a sequel, imaginatively titled **Joe Blade II**. The year is 1995, the setting London, and the streets are filled with punks and muggers. Ordinary citizens are held prisoner in their own homes, too frightened to venture outside. Only one man can clean up the city. In the shops now at £1.99 on tape.

● Blue Ribbon Software has acquired three old Bubble Bus CPC titles for re-release. Once more you will be able to take on the role of Pothole Pete in **Wizard's Lair**, wander round the master's house at midnight as Sammy Solver in **Deathsville** and rescue the lovely Princess Grizelda in **Paladin**. All three to be released soon at £1.99 each on tape.

● Mediagenic – formerly Activision – has acquired the licence to Die Hard, the latest Bruce Willis action adventure film from 20th Century Fox which grossed over $10 million in its first week of release.

This latest deal sees a continuation of the relationship between Mediagenic and 20th Century Fox which began with the licensing of

DUTY FREE



When travelling abroad it's easy to appreciate the value of duty-frees. Now you can get a duty-free deal right here at home.

The Citizen MSP15E, easily recognised as the practical, low-cost wide carriage printer, is now built in Britain.

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There's simply no other low-cost wide carriage printer which offers you more.

For more details on your duty-free deal contact: The Citizen Customer Response Centre. Telephone: 0895 72621

CITIZEN
COMPUTER PRINTERS

Aliens in 1986. **Die Hard**, the computer game, is scheduled for release next year.

Mediagenic has also signed a licensing deal with arcade giant Sega. The agreement gives the Reading-based software house the conversion rights to five coin-op games, all due for release next year.

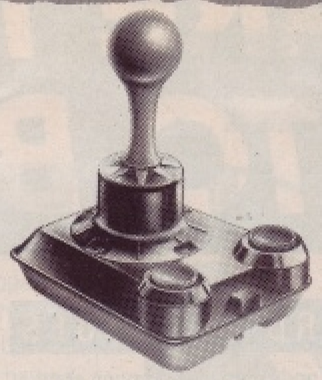
Galaxy Force, a breakneck speed race through a choice of five spacescapes, is currently the No.1 arcade game in America and Japan; **Altered Beast** has been competing with Galaxy Force for the No.1 spot across the Atlantic and has players teaming up to kick, punch and jump over an assortment of nasties while **Ace Attacker**, a new arcade release, is a volleyball simulation.

Two games yet to be released in the arcades, **Sonic Boom** and **Hot Rod** will complete the quintet.

● Cheshire-based Kixx Software has developed a novel line in poetic press releases:

"At Amstrad User we hope you've time, To play our games – they're £2.99, The name is Kixx, Producing hits, And we're not asking much, Not even a favour as such, Just a word or two, And a good review."

The games in question are re-releases of **Gauntlet** and **Metrocross**, in the shops now on tape at £2.99 each. Come back Wordsworth, all is forgiven.



The Replay Micro Blaster



The Konix Predator



The Konix Megablaster

Joystick jamboree

PICTURED here are three joysticks to look out for. One is making a Compumart comeback, while the others were launched by Konix at the recent PC Show.

Although superficially similar in design, the Konix Predator and Megablaster joysticks are internally quite different. The more expensive Predator (£12.99) is operated by microswitches, while the Megablaster (£6.99), with the body of a Predator and the handle of a Speed King, has more traditional internal workings.

Wales-based Konix has now sold almost three million units of its hand-held Speed King, a joystick that is compatible with all major home computers. Likewise, the Speed King's two new brothers in arms can be used with all CPCs.

Still on joysticks, Compumart has taken £3 off the price of the Micro Blaster, bringing it down to a more competitive £12.95. This red and black model with non-slip rubber feet features eight high quality microswitches, a switchable single fire or rapid fire button and an extra long 1.4 metre cable.

Compumart is also giving away one Amsoft 3in disc with every order for a CF2 disc storage box, which just goes to show that what you lose on the bank balance, you gain on the roundabouts. Compumart can be contacted on 0509 610235.

Give my regards to Fleet Street

AFTER two years in development, the CPC version of Mirrorsoft's Fleet Street Editor is ready for release.

Designed for the 6128 only, Fleet Street Editor comes on two discs, one holding the graphics library, the other the fonts and three fully integrated program modules.

The first of these is the Art Studio, which is used for creating or modifying illustrations. The Copydesk module is used for word processing and making up pages, while the Administration Department deals with file handling and includes a conversion program for imported graphics files.

The graphics library fills both sides of the second disc. It contains an impressive collection of useful illustrations, symbols and decorative lettering which you can use to enhance your own work.

Fleet Street Editor has been designed with a wysiwyg interface, meaning the images of text and graphics displayed on the screen are the same as those the program will print out.

Fleet Street Editor is out now at £39.95. More details in *ACU* next month when we put Fleet Street Editor up against Stop Press.

GALLUP *Software* CHART

TM	LM	Title	Company	Price	MS
1	*(1)*	Football Manager 2	Addictive	£9.99	100
2	*(4)*	Air Wolf	Encore	£1.99	97
3	*NEW*	Stunt Bike Simulator	Silverbird	£1.99	83
4	*(2)*	Ace	Cascade	£2.99	78
5	*(5)*	Beach Buggy Simulator	Silverbird	£1.99	77
6	*(7)*	Frank Bruno's Boxing	Encore	£1.99	76
7	*NEW*	Battleships	Encore	£1.99	75
8	*(13)*	Rocky Horror Show	Alternative	£1.99	74
9	*(10)*	Super Stuntman	Code Masters	£1.99	71
10	*(6)*	Steve Davis Snooker	Blue Ribbon	£1.99	71
11	*(3)*	Yogi Bear	Altrnative	£1.99	71
12	*(11)*	European 5-a-side	Silverbird	£1.99	69
13	*(8)*	Rally Driver	Alternative	£1.99	69
14	*RE*	BMX Simulator	Code Masters	£1.99	63
15	*(9)*	Fruit Machine Simulator	Code Masters	£1.99	62
16	*NEW*	Target Renegade	Imagine	£9.99	61
17	*(14)*	Ghostbusters	Mastertronic	£1.99	60
18	*NEW*	ATV Simulator	Code Masters	£1.99	55
19	*(16)*	Out Run	Sega US Gold	£9.99	54
20	*(20)*	Trap Door	Alternative	£1.99	53

Freescape hits the Sahara

THE new Freescape solid 3D game from Incentive is to be called Total Eclipse, a mystic experience set deep in the heart of Egypt.

Weird hieroglyphics, giant pyramids and a strange curse lie before you under an ever darkening sky. Your mission is to solve the puzzles and find your way through the many shrines, temples, underground tunnels and hidden passageways in an attempt to collect as much treasure as you can before the curse – the total eclipse of the title – comes into effect.

Incentive boss Ian Andrew told *ACU*, "Due to our new compression system, Total Eclipse will be a lot bigger than the two previous Freescape games."

The game is scheduled for release middle to late November, but you can read the full Total Eclipse story first in an *ACU* exclusive next month. On sale date, 2nd November – don't miss it.



SOFTWARE THAT'S HARD TO BEAT

TASWORD 6128

The Word Processor — with Mail Merge

The established, powerful word processor for the Amstrad CPC 6128. TASWORD 6128 has been specifically developed to use 64K of memory as text space. This means a text file can be a massive 60,000 characters in length, enough room for over 10,000 words!

Featuring all standard and many extra word processing facilities TASWORD 6128 incorporates sophisticated print options, on-screen help, notepads, user definable keys allowing commonly used words, sentences or paragraphs to be typed with a single keypress and a powerful built-in data merge facility.

Extensive customisation facilities allow many of the facilities to be changed for personal requirements and saved into the program.

By combining power with ease of use TASWORD 6128 is the complete word processor for the CPC 6128. **Disc £24.95**

TASWORD 464-D

The Word Processor — with Mail Merge

The TASWORD especially developed to utilise the capabilities of the CPC 464 and 664 disc drives. Additional facilities include a larger text file size and automatic on-screen disc directories during save and load operations.

A major feature is the data merge facility. Mail merge, in which a letter is printed any number of times, each individually addressed to a different person, is just one application of this powerful facility. TASWORD 464-D is supplied on, and only runs on, disc.

Disc £24.95

TASWORD 464

The Word Processor

Your 464 becomes a professional standard word processor with TASWORD 464. Supplied complete with a comprehensive manual and a cassette which contains both the program and TASWORD 464 TUTOR. This teaches you word processing using TASWORD 464. Whether you have serious applications or simply want to learn about word processing, TASWORD 464 and the TUTOR make it easy and enjoyable.

Cassette £19.95

TASWORD UPGRADES

TASWORD 464 and Amsword owners: send your original cassette or disc (not the packaging) as proof of purchase and £13.90. Your original will be returned together with TASWORD 464-D or TASWORD 6128 on disc.

TASCOPY 464

The Screen Copier for the CPC 6128, 664 and 464

A suite of fast machine code screen copy software for the CPC computers. Print high resolution screen copies in black and white and also large "shaded" copies with different dot densities for the various screen colours. TASCOPY can also print "poster size" copies — screen copies printed onto two or four sheets can be cut and joined to make the poster. **Disc £12.90 Cassette £9.90**

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NEW!

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TAS-SPELL checks the spelling of text typed with TASWORD 464-D and TASWORD 6128 by comparing the words in your text with those in a dictionary of over 20,000 words. Suspect words are highlighted — you may correct, ignore (it might be a name) or even add words to the dictionary. Please note that TAS-SPELL only works with TASWORD 464-D and TASWORD 6128. **Disc £16.50**

TASPRINT 464

The Style Writer for the CPC 6128, 664 and 464

A must for dot matrix printer owners!

Print Tasword output and program listings in a choice of five impressive print styles. Varying from the futuristic DATA RUN to the hand writing style of PALACE SCRIPT, TASPRINT gives your output originality and style! **Disc £12.90 Cassette £9.90**

TAS-DIARY

The Electronic Diary
TAS-DIARY for the Amstrad CPC 6128, 664 and 464 with disc drive

Keep an electronic day-to-day diary on disc! TAS-DIARY features a clock, calendar and a separate screen display for every day of the year. Each year stored on disc includes a memo pad and several note pages.

TAS-DIARY is an invaluable aid to keeping records, reminders, and any other data which is related to that most valuable commodity of ours — time! **Disc £12.90**

Tas-Sign, Tasprint and Tascopy drive nearly all dot-matrix printers including those made by:

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Astech	Datech	Newbury	Sord
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C. Itoh	Kaga-Taxan	Seikosha	

If you do not want to cut this magazine, simply write out your order and post to: TASMAN SOFTWARE, DEPT ACU, SPRINGFIELD HOUSE, HYDE TERRACE, LEEDS LS2 9LN.

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You are wonderful

WELL not only you, although you did happen to print a reply to one of your readers in the first *ACU* I received after joining the user club early this year which sorted out a problem I was having with adjusting the DIP switches on my DMP3160.

No, I mean the whole team, including the kind young man who advised me on the phone about a problem I was having with Professional Lawnmower Simulator. I didn't understand half of the technical language, but he got me there in the end and was very patient in doing so.

Now that wretched machine runs around the garden like the proverbial vomitoria calliphora – far too fast for my rather ageing fingers. Is there any way it can be slowed down?

Incidentally, thank you for the very clear and simple explanation of Proofreader, and the Erratherapy. Didn't need the latter, as it happened, but at least I could understand the language. Not all of your readers are computer experts, and a little bit of simple explanation is very helpful.

M Kinley,
Seaton, Devon.

LD: To slow PLS down, add the following line to the program. Increase the number following the TO to slow it down further, but remember that the time ticks away at the same rate.

```
1585 FOR delay=1 TO 100:NEXT
```

Cut the scribble

BEING colour blind and having bad eyesight, computing has its problems for me, and one of them is the wazzock with the felt tip pen at *ACU*. Please take his pen away, or tie him up. He spoils the magazine and makes it very hard for me to read it.

A Haynes,
Wordsley, West Midlands.

LD: You and a thousand others, Mr Haynes. I told the art dept wazzock you wouldn't like it. They'll complain, I said. But does anyone listen to me?

But the art dept wazzock has listened to you. You now have nice bold replies with ever so faint artistic thingies underneath. Happy? Good. So am I. The wazzock is sulking.

Dotty DMP

MY DMP2160 printer seems to be a bit dotty. It has been like this since I bought it. I ran the Micro-Design program and I find a line of dots appears on the printout down the page, as you can see from the printouts I enclose. I get this problem with the Mini Office graphics program too.

With text dumps and ordinary printing the printer works very well with all the various control codes I have tried, but the screen dump program at the back of the printer manual does not seem



to work. All that happens is the printer paper out alarm starts up, and does not stop. Also the Scale option for A6 and A8 sized printouts do not work on the Micro-Design program with my DMP2160.

Fred Button,
Newbury, Berks.

LD: I experienced a very similar problem to this a couple of years ago with a Citizen 120-D printer. After months of anguish I phoned Citizen and between us we decided it was a dodgy Prom – that's the chip inside the printer that enables it to talk to the computer.

I sent it off to their offices in Uxbridge, and it turned out to be a very old version with a bug in it. Apparently I shouldn't have had it. Anyway, Citizen sent me a new Prom, which I very carefully fitted, and the problem went away.

I suspect you, too, have a dodgy Prom. You'll need to phone Amstrad Customer Services (0277 230222) to get a part number, and then CPC Ltd (0772 555034) to see if they stock it as a spare part. Alternatively, if it is still under guarantee, you could return the printer to your dealer to put right.

The Forth Protocol

I HAVE long been a reader of *ACU* – haven't missed an issue since August 1986 – and over the years I've picked up Basic and dabbled with machine code. But I have found a new toy – Forth.

I have a Forth interpreter – not very good as it is a magazine type-in, but it works – with a handful of keywords, but I need more. I know it is possible to add more, but how?

Is there any remote chance you could do some articles on programming in Forth, similar to the Basic Tutor series? If not, could you recommend some good books on Forth programming. Also, could you print my address in the hope that other users of Forth on the CPC will contact me?

R. Williams,
Kesgrove Hall,
Kesgrove, IP5 7PU.

LD: At the risk of upsetting the thousands of astro-physicists who read this magazine, I have to say that as powerful as it is, Forth is not a very popular language with CPC users.

***ACU* did a tutorial series on Forth that ran from March to August 1985 – a volume that is long since sold out unfortunately – and I wouldn't hold your breath waiting for another one. Instead, get hold of *FORTH The NEXT Step* by Ron Geere. It is published at £8.95 in paperback by Addison-Wesley (ISBN 0-201-18050-2).**

Warm reception

I HAVE come across a product which I am puzzled about. It concerns the add-on which, when plugged into a VDU, turns it into a television. What I would like to know is, does this product work with a monochrome screen, and do I need a TV licence?

Miss K. H. Lakhman,
London NW10.

LD: Yes, it works with a monochrome monitor, although I'm sure you could pick up a new black and white portable TV for less than the price of a TV tuner. You only need a licence if the TV tuner is the only television receiver in the house.

Absolute beginners

AS a complete novice to computing I find *ACU* quite interesting, but have one major criticism, not only of *ACU*, but of the computer fraternity in general. This is that there seems to be an assumption that everyone with a computer is an expert. For the most part, the beginner is left completely baffled by what could be a foreign language. Even the instruction manual does not answer all one's queries in simple terms.

For example, I know that the CPC464 is a 64k machine. But in terms of information storage, what will it do? So many bits or bytes is useless to me. I have only recently found out what I think is the answer, 43,533 characters including spaces. How many spaces must I leave for when I eventually purchase a printer is a mystery yet to be solved.

Please, more information for absolute beginners.

J Stephens,
Stourbridge.

LD: We don't assume that everyone is an expert, but we do assume that most of our readers have

Send your letters to:
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That alone would have satisfied many people, but Romantic Robot has gone one step further, incorporating a memory editor. No program is safe with this: everything is out in the open, including the Z80 registers, CRTC data and any part of memory.

Don't be fooled into thinking this will result in mass piracy, however. The *Multiface* unit itself must be plugged into your Amstrad to allow reloading of a program it saved.

Multiface II must be the cleverest hardware device at present – a necessity for disk owners who thought they were stuck with loading from tape every time.

AMSTRAD ACTION JANUARY 1987

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at least a partial understanding of computer jargon. You complain that so many bits or bytes means nothing to you. But there is not another word to describe what you want to know.

To describe "bit" in layman's terms would take a whole paragraph or more; you can't expect us to do that every time we want to use what is a very simple computing term.

You want to know how much free memory (information storage space) you have? Turn to Chapter 8 Page 18 of your 464 manual. Study the section to do with the FRE keyword. After that, get yourself down to your local library and pick up a few simple books on computers – not on the CPC464 specifically, just on computers and computing in general.

Relative newcomer

DEAR Auntie John, it came as a great shock to me to find out that I have yet another relative, namely yourself. To get over this shock I will require the listings that were not quite right in the July issue. While I'm on that subject: Don't try and blame the cat, it doesn't wash. I should know, I try it all the time.

I am just a beginner to machine code, which is why I am finding your series of articles very amusing and educational indeed. I look forward to learning more from you.

Chris Davie,
Dundee.



Spritely answered

IN the August *ACU* Ron Aldridge requested a chart in order to design his own colour pattern to use with the SPRITE routine as used in Isobot and Polar. I enclose copies of a chart I have worked out, having encountered the identical problem as that faced by Ron. There are no guarantees that the chart will work for all applications, but there is no obvious reason to suppose otherwise.

S Ormiston,
Norwich.

LD: Many thanks. Copies of Mr Ormiston's chart are available on request to: *Sprite Chart, Amstrad Computer User, 169 Kings Road, Brentwood, CM14 4EF.* Please enclose an sae and one 18p stamp.

Six weeks from Home

I WOULD like to reply to Paul Johnston's letter in the August issue. I have been with the Home Computer Club for a year now, and I find them very reliable. Their range of software is very good – and so are their prices – but the software takes about six weeks to arrive. I suppose this is due to them having so many subscribers.

Paul Sell,
Belfast.

Life saver

THUNDER strike me down. What have I done to deserve such a heavenly being to communicate with down the telephone. Confused? Good.

I was happily looking through your wondrous magazine when I came to Auntie John's spot. Oh, Heaven forbid if I ever missed it. I went straight to Alias (that's my computer's name) and starting typing away at around 203cps – give or take a couple of hundred. The program was going to call up a graphics screen at the touch of the spacebar.

I typed in the Basic poker – I can't afford an assembler, all my pennies are saved so I can buy *ACU* every month; grovel, grovel. I did as it told me to and then ran the small program on page 61, the middle column. Scream!!! It crashed.

With tufts of hair between my fingers I crawled to the phone with *ACU* between my teeth. I got the number from the front of the magazine, dialled your editorial office and... oh what a heavenly being.

I told him what had happened. He flicked through his magazines, loaded a few discs and checked the listings. Then "A-harr" came from down the phone. "I know this one", he said. He told me line 120 should be *a=&8000*, **not** *a=&4000* as printed. I thanked him and got straight back to my computer.

It worked! My faith in *ACU* was at maximum. I think you should promote that chap to doorman or something. Whoever he is, he is a life saver.

Barry Gallagher,
Arnold, Nottingham.

LD: Erm (blush) thank you. I think.

Drawing a blank

BEING new to computers, I am not sure what to do about blank cassettes. Please can you tell me if I need to buy special computer tapes and, if so, where from? No one seems to advertise them in your magazine, and the shops around here do not sell them. Will cassettes used in cassette recorders work?

M Jones,
Colwyn Bay.

LD: You don't need special cassettes, any ordinary music cassette will do, although Ferric seem to be more reliable than Chrome. Luckily, Ferric tapes are the cheapest.

It is also unadvisable to use anything above a C60; the tape in C90s is so thin that it can stretch if you breath heavily on it. Very cheap cassettes, like the ones sold in petrol stations at 10 for 50p or something equally as silly, tend to be made up of three or four shorter pieces of tape stuck together. Avoid these sort of cassettes, the bits where the tape has been joined will drive Arnold crazy.

Most computer shops – and retailers like John Menzies, Dixons, Woolworths and Tandy – sell good quality C15 cassettes (seven and a half minutes per side) that are specially prepared and packaged for computers. If you can't find any of these, choose a famous brand name C60 – Maxell, TDK or the like. Failing that, pinch your father's Wagner cassettes and record over them – he'll never know the difference.

No reflect action

I am having a slight problem with the Reflections listing from the July 1988 *ACU*. I keep getting *Memory full in line 150* coming up. I have amended the error reported in August, but still the same thing happens. Can you shed any light on the problem?

N. Jopling,
Doncaster.

LD: The only way I think you can get this error message with Reflections is if you RUN the program over and over again without resetting the machine. This would cause HIMEM to be lowered bit by bit, eventually causing the *Memory full* message. Or you could have mistyped the value assigned to *proglen* in line 140.

Have another check, Mr Jopling. There are no errors in the listing apart from those already reported.

Pretty Polly

I WAS interested to see the letter from Mervin Rogers of Treasure Island Software in your August issue concerning the use of the Parrotry Plus package for building design. I have had experience of using this package for both building drawings and artistic design with a Facit-4550 six pen, A4 moving paper, moving pen head, flat bed plotter.

I had been corresponding with Mr Rogers ear-

lier this year on the question of affordable plotters to work with my 664, and he had already devoted considerable time and trouble to supplying me with the names and addresses of various suppliers when he advised me of a company called SCS Ltd, 20a Horseshoe Park, Pangbourne, RG8 7JW, who supply the Facit-4550 for £249 + vat. They also supply an A3 model at a slightly higher price.

The Parrotry Plus package, including the library and plotter utility with its provision for scale adjustment and ability to use any of four quadrants, has enabled me to spend many fruitful hours of pattern design.

B A Knight,
Mortimer, Berks.

Drunk and disorderly

I AM writing to query you about my deranged 6128. Recently I switched it on and started to type something in. What came out on the screen was totally different from what went in. The keyboard was scrambled something chronic. I came to the conclusion that either it was seriously overhung from the party the previous night, or something was definitely wrong.

I tried to rectify it by turning the computer off and back on again, but the fault still remained. I then tried removing the peripherals one at a time, and traced the cause to the joystick port. With the Quickshot II Turbo in, the keyboard scrambled, with it out it was fine. With my mouse plugged in, normal behaviour ensued.

After a short time the keyboard resumed its usual behaviour, even with the Quickshot II in the port. It has done it once more since that time, and the fault was again the joystick port. What's wrong? I believe that it is the joystick. Could it possibly be the port, or the computer itself?

John Kimber,
Swansea.

LD: The joystick port is connected to the keyboard and is scanned for movement at the same time as the keyboard is for keypresses. That is why when you press the Fire button you get an X on the screen. The fact that your mouse works fine is a good indication that there is nothing wrong with your joystick port. Your Quickshot II Turbo is almost certainly broken. Check it out by asking a friend to use it on his computer for a while. See if he gets the same results.

PLS improper argument

IN the August issue there was a program called Professional Lawnmower Simulator. I have typed it in twice and I am still getting the same problem. I got rid of the syntax errors, but I cannot get rid of the improper arguments.

First I got *Improper argument in line 10*. I got further on in the program by cutting off the end of line 10, leaving just the words MODE 1. Later on I got *Improper argument in line 1810* and I could not get rid of it.

I have tried everything I know, and everything the instruction booklet has told me to do. Please, do you think that you could help me?

Lee Cadham,
Slough, Berks.

LD: This is a bit of a long story, so listen carefully. The *Improper argument in line 10* is caused by the SYMBOL AFTER command. It is a rule of Locomotive Basic that if you are going to use both the MEMORY and SYMBOL AFTER keywords in your program, the SYMBOL AFTER command must be executed before the MEMORY one. Professional Lawnmower Simulator does this correctly by issuing the SYMBOL AFTER in line 10, and the MEMORY in line 80.

With me so far? OK. Here comes the confusing bit. If the program crashes, with a *Syntax error* for example, you will not be able to correct the mistake and RUN the program again because the SYMBOL AFTER command in line 10 would then be executed after the MEMORY command that was executed the first time you ran the program. Arnold, you might say, has a long memory.

All this means is that PLS must be run from a clean machine, a machine that has just been switched on. If you have typed the program in correctly, it will run; the listing contained no misprints. The *Improper argument in line 1810* is being caused by you stealing the SYMBOL AFTER 238 command from line 10. Put it back, you naughty boy.

Multi-price multi-speed

IN the July *ACU* it said that the MicroLink multi-speed modem costs £169, and in the August issue it said it cost £179. Which is the correct price?

William Mostyn,
Dorstone, Herts.

LD: At the time each of those issues went to press, both prices were correct. In other words, it's gone up a tenner. I should grab it quick at £179 before it happens again.

Lack of memory

THANK you for printing my letter about disc corruption in your September issue. However, you do not entirely understand the situation.

I do realise that the following requires some imagination, but it is quite possible for a person to be disabled, and for part of that disability to be lack of memory. It would be very easy for such a person to switch off his or her computer with a disc still in the drive, and corrupt it. Would you describe such a person as a "careless disc user"?

Chris Whiting,
Croydon.

LD: It would also be very easy for such a person to contact the software house that produced the disc and ask them for a replacement. I would respectfully suggest that a person disabled as you describe would be well advised to sellotape a note to his or her disc drive to remind him or her to remove the disc from the drive before switching off.

Rule Rombo

WHICH rom board would you recommend? I have read good reviews of the Super Rom Plus by Britannia Software and Rombo by Rombo productions. If I purchase one from through mail order from over in the UK, which mail order company would you recommend?

Bill Gifkins,
Pahiatua, New Zealand.

LD: The Rombo rom board at £27 from WACCI looks like a good deal to me. Hunt out their advert in this issue. I suspect they'll want an extra couple of quid for international postage.

Frustrated Norwegian

I HAVE seen that some English Amstrad owners complain about the prices of software. Here in Norway a game costs about £14 on tape and about £21 on disc. I'm not going to complain too much, but can I just ask: Why the Hell are the games so viking expensive? I have to save money for two to three months before I can afford to buy them.

Roger Jacobsen,
Sandefjord, Norway.

LD: You have my sympathy, Roger. Have you tried any of the UK mail order companies that advertise in *ACU*? You might get a better deal from them.

Hex in the bin

THOUGHT you might like this little program that I make use of now and again. I use it on a 6128, so I don't know if it works on a 464 or 664. You will have to try it out. If you type it in, don't change the string length, it fills the key buffer as it is.

M.J. Vale,
Havant, Hants.

```
1 ' Program to define f0 key on
2 ' the numeric keypad to give
3 ' DEC$, HEX$ and BIN$ conversion.
4 '
5 ' By M J Vale.
6 '
7 ' Press f0 key to run the program.
8 '
9 KEY 128,"for a=0 to 255:?tab(3)"+CHR
$(34)+"DEC$"+CHR$(34)+"(a);:?tab(14)"+
CHR$(34)+"HEX$ &"+CHR$(34)+CHR$(43)+"h
ex$(a);:?tab(26)"+CHR$(34)+"BIN$ "+CHR
$(34)+"bin$(a);:next:"+CHR$(13)
```

LD: Pretty impressive. Works fine on all CPCs. What are you trying to do, start off a Write to Reply one-liner craze or something?

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Alan Sugar
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The new Navigator has a unique trigger and pistol-grip shape, which should help you to destroy the most elusive of alien. *Amstrad Computer User* has 12 Navigator joysticks, worth £15 each, to give away to the winners of this competition.

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RULES

1. The winners will be the first 12 correct entries opened on 30th November 1988.
2. You may photocopy the form, but only one entry is allowed per reader.
3. Anyone found entering more than one will have all their entries disqualified.
4. Employees of Amstrad Computer User and associated companies may not enter. We spend far too much time playing games as it is.
5. The decision of the editor's assistant is final. (We can't trust the Ed.)

QUESTIONS

1. Who was the first Englishman to circumnavigate the globe?
   (a) Walter Raleigh (b) Francis Drake (c) Captain Pugwash
2. And who did it on his own during 1966/67?
   (a) Frank Sinatra (b) Francis Chichester (c) Trevor Francis
3. What were the original "navvies" constructing to earn their nickname?
   (a) Roads (b) Railways (c) Canals

ENTRY FORM

1. c 2. b 3. c

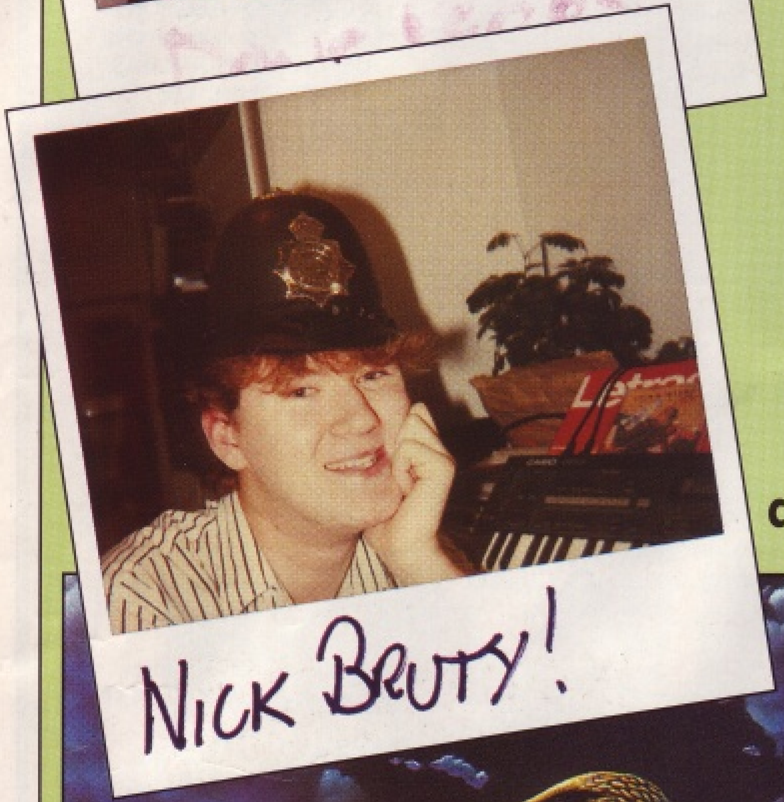
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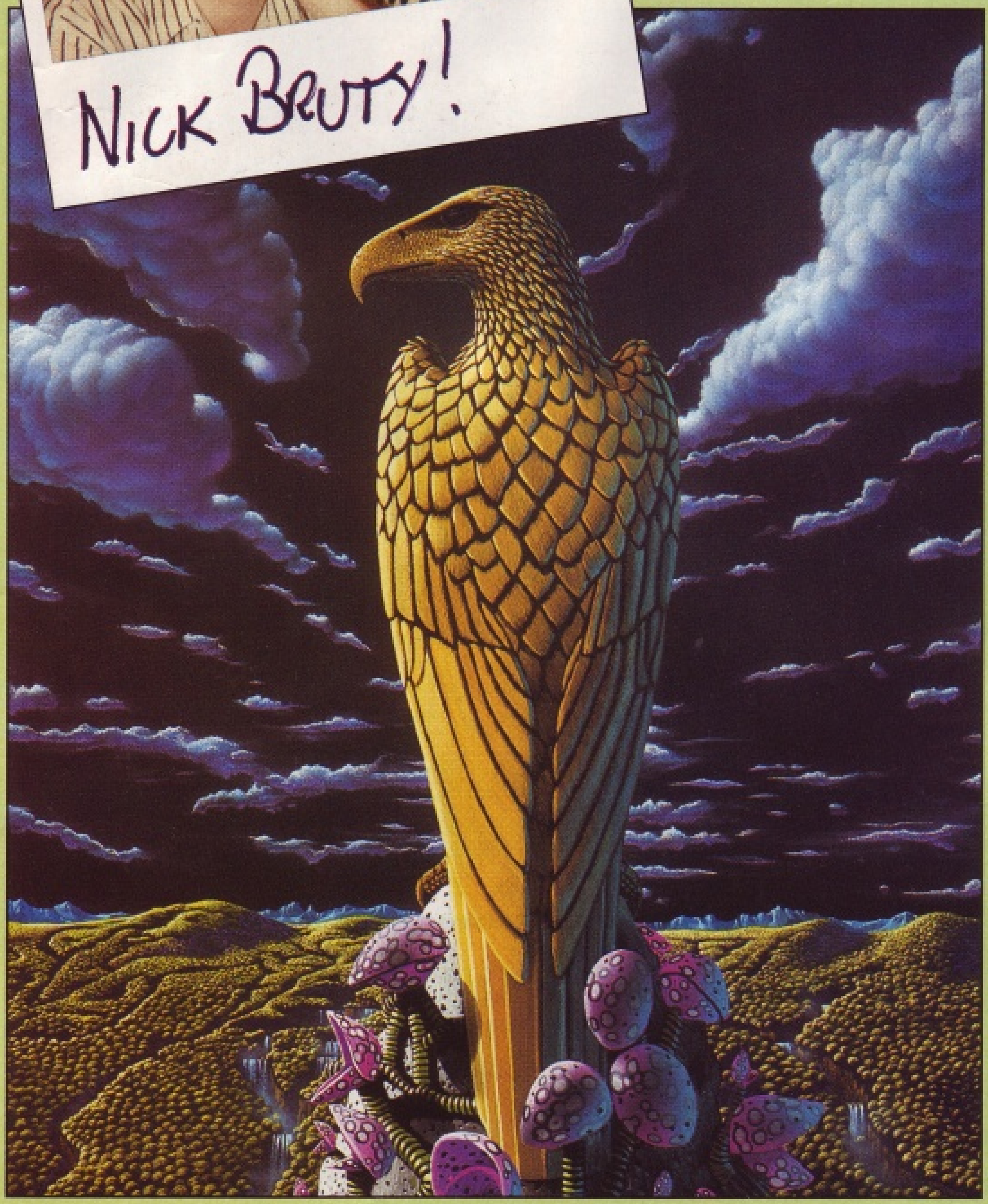




FEATURE

The Savage story

David Perry writes about the ideas and programming problems behind the development of his new CPC-coded mega game



MY Z88 was lying under my bed collecting dust. It had been there since a week after I had first showed it off to everyone. I picked it up, wiped the dust off with my hand and the U key ripped off, flying back under my bed.

Beneath the bed I courageously went, fighting my way through endless listings, smelly socks, rancid coffee cups and uncashed cheques. By the time I located it a man-eating spider had laid claim to it, so I gave up. I rang Cambridge Computers and, can you believe it, they wanted £25 for a new U key.

So as far as this article goes, if there are any Us missing, togh!

I, David "is it my imagination or is everyone else shorter than me?" Perry have been knocking around the games world for about seven years. And yes, I started on a ZX81. In the cold and frosty winter of 1981, I found it made a great little hot water bottle.

I was thinking of writing to Sir Clive to arrange dealership for exploiting a vast potential market – the world's first yuppie hot water bottle – but he dashed my hopes by releasing the Speccy, which was too big for the average yuppie inside-breast pocket.

My fellow collaborator, Nick "wear dark sunglasses when skate boarding" Bruty, has been trying to design graphics on computers for two years now. It must be said that after the first year, when someone told him he didn't need typewriter correction fluid on the screen, he did much better. He is really a frustrated programmer at heart and has lots of bug ridden sprite routines to show off his wonderful graphics.

In the olden days I used to work at Mikro-Gen with recluses such as Raffaele "Cybernoid" Cecco, Dave "Ikari Warriors" Shea, Chris "Battle of the Planets" Hinsley and Nick "Vixen on the CBM" Jones. I also got the odd visit from my old pal Chris "Nebulus" Wood, who I first met at a Microfair while I was wearing a huge Wally Week outfit consisting of a great big papier mache head with a huge red nose and buck teeth. He says he didn't notice the difference when I took it off. Grrrr.

At Mikro-Gen I wrote games like Herbert's Runny Bum and Stainless Steel. I also wrote Three Weeks in Paradise, which was at first to use the ill-fated MicroPlus add-on rom; it caused great hassles when that add-on flopped, meaning I had to crowbar a 64k game into 48k.

After a blood-stained mutiny over the length of lunch breaks, I turned freelance along with Raff, Chris Hinsley and Nick Jones. Mikro-Gen went

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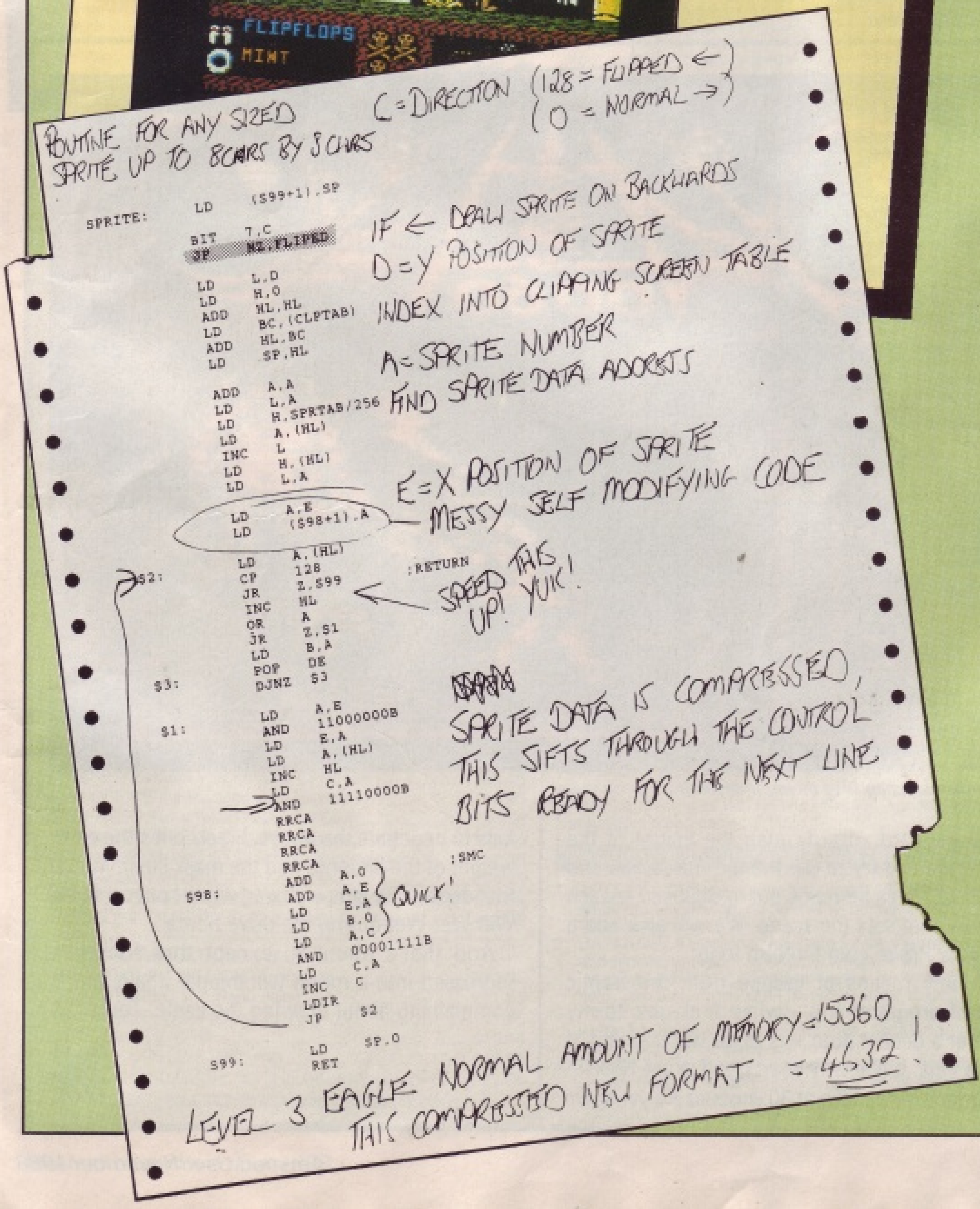
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ROUTINE FOR ANY SIZED SPRITE UP TO 8CHARS BY 8 CHARS

C=DIRECTION (128 = FLIPPED ←) (0 = NORMAL →)

```
SPRITE:  LD      ($99+1),SP
         BIT     7,C
         JP      NZ,FLIPED
         LD      L,D
         LD      H,0
         ADD     HL,HL
         LD      BC,(CLPTAB)
         ADD     HL,BC
         LD      SP,HL
         ADD     A,A
         LD      L,A
         LD      H,SPRTAB/256
         LD      A,(HL)
         INC     L
         LD      H,(HL)
         LD      L,A
         LD      A,E
         LD      ($98+1),A
$2:      LD      A,(HL)
         CP      128            ;RETURN
         JR      Z,$99
         INC     HL
         OR      A
         JR      Z,$1
         LD      B,A
         POP     DE
$3:      DJNZ    $3
         LD      A,E
$1:      AND     11000000B
         LD      E,A
         LD      A,(HL)
         INC     HL
         LD      C,A
         AND     11110000B
         RRCA
         RRCA
         RRCA
         RRCA                   ;SMC
$98:     ADD     A,0
         ADD     A,E
         LD      E,A
         LD      B,0
         LD      A,C
         AND     00001111B
         LD      C,A
         INC     C
         LDIR
         JP      $2
$99:     LD      SP,0
         RET
```

IF ← DRAW SPRITE ON BACKWARDS

D=Y POSITION OF SPRITE

INDEX INTO CLIPPING SCREEN TABLE

A=SPRITE NUMBER

FIND SPRITE DATA ADDRESS

E=X POSITION OF SPRITE

MESSY SELF MODIFYING CODE

SPEED THIS UP! YUK!

SPRITE DATA IS COMPRESSED, THIS SIFTS THROUGH THE CONTROL BITS READY FOR THE NEXT LINE

QUICK!

LEVEL 3 EAGLE NORMAL AMOUNT OF MEMORY=15360
THIS COMPRESSED NEW FORMAT = 4632!

"At Mikro-Gen I wrote games like Three Weeks in Paradise, Herbert's Dummy Run and Stainless Steel"

bust and was bought by CSD which, not to be outdone, went bust itself.

Chris and Raff now live together, though not in the biblical sense, and Nick Jones is about to start a life of sin with his girlfriend, proving that great programming teams never die, they just smell funny. Enough of the totally untrue life story, what about the game...

The best game ever

The last game I wrote for Probe was Trantor. That was when I joined up with Nick Bruty, who produces amazing graphics if you are prepared to listen to Bladerunner theme music all day long. We got on well together, and decided to work as a team on future projects.

Fergus McGovern, the boss, was happy we were working together because as I tend to work in daylight, Nick actually had to get out of bed in the mornings. This made sending Fergus demos before the Post Office closed that much simpler.

To celebrate Nick changing from a moon worshipper to a sun supplicant Fergus gave us a nice simple task to get started on. Quote: "Make it the best game ever". Not too difficult to beat Bravestar, eh Ferg? The only way I could see how to do that was with lots of graphics, lots of music and lots of program.

When he is actually up in the daytime, Nick watches TV, irons clothes, shops – anything to avoid work – issuing statements like: "I am a creative person... I need my inspiration... Rome wasn't built in a day..." To make sure he *does* work, we arranged for him to work at my house.

The trouble is, Nick only has two cars. The invalid carriage-blue Ford Capri is permanently on the operating table, and the other – the amazing Turbo V8, 3.5 litre boot, electric bonnet, power assisted petrol cap, anti skid seat covers for those difficult bends – was designed by computers, built by robots and wrecked by Nick. So now the train takes the strain.

The game, which we would eventually title Savage, is presently about a man who is chained up in a dungeon, soon to be horribly executed. The death sequence was going to show the man playing the Amstrad version of Quartet, followed by his brain exploding – but we thought this a bit anachronistic and unnecessarily cruel.

The man in Savage is looked kindly upon by one of his gods, who takes pity on him and promptly sets him free from his cell. In level one you must help him escape from the dungeon complex. Lots of killing involved. My sort of game. Huge explosions. Eat your heart out, Raff. Yeah!

Level two would be running down from the hills through a solid 3D animated valley to get away from the city; level three would be where you return to the city on the back of an armour clad panther to save your fellow prisoners.

Each level would be a completely different load and style, but each would follow on in plot from the previous one, so making this the most

humungous game ever written for the Straddles. You would be given a code at the end of each level that would make the next level stacks easier, but you would be able to play any level at any time for practice.

The first idea was to have each level being the next stage of evolution. Nick wanted it to start as plankton – one spray of the air brush and that would be all the graphics drawn – but we decided you would start as a monkey, and mutate upwards to eventually become a barbarian type warrior. This then changed because Nick hated the idea of drawing a monkey.

So we decided to start as a barbarian type warrior in the days of Ben Hur and have a game of slave races, gladiators and chariot races. We would call it The Roman Games.

Nick didn't see how you could have big horses, a chariot and a man on horseback fighting other men in other chariots without it looking like a horrible mess. So it changed again, this time to the barbarian type man locked in a dungeon about to die. Stuck for a title, we called it Project 5 until I came up with the idea of being in control of a giant eagle instead of a panther at the end of level three. We would call it Eagle Warrior and design the rest as we went along.



The wizardy old man from the introductory screen



Dodge the Monoliths in level two



Pots of energy in level three

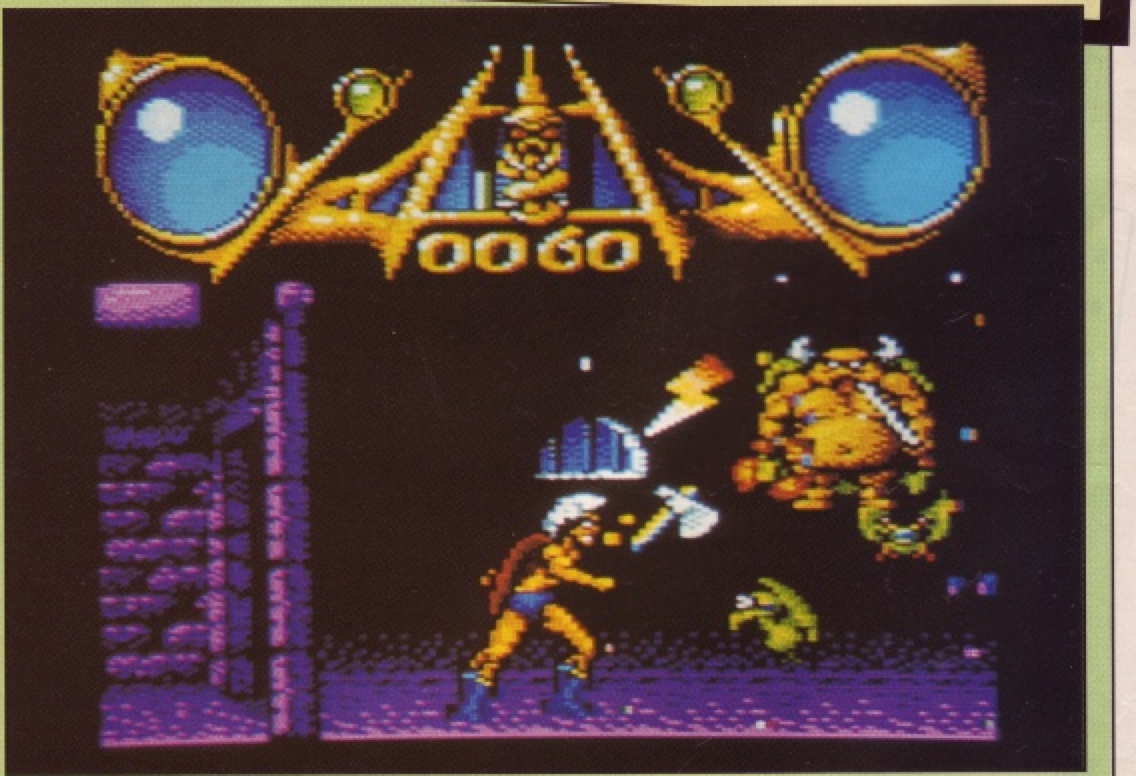
Early days

The scrolling was easy peasy lemon squeezy – just a matter of dusting off the Trantor routines. Oops. What a give away. It was really hard, Fergus. Honest.

To get the big man fully animated I needed to squish his frames as much as possible. I knocked together a utility called Toast. It compressed the man's frames from 12k down to 4k. Great. Then Nick added a cape and a mask so he stood out well from the background, and it grew to 6k. Oh well, 6k is still good for a 64 x 64, twelve-frame man.

We were never happy with the animation of the main man because he insisted on running and moving like a wimp. The animation changed and changed and changed – we gave him swords, capes, helmets, armour... Then we decided on the Gonad the Barbiturate look – big chest and groin. He now looks like a pretty mean hunk; a savage warrior. That's where the eventual title of the game came from.

Anybody who saw Trantor might just have noticed that Nick draws a pretty nifty display panel. So through the screams of "I hate drawing panels", rabid scribbling and stabbing his sketch pad, he whipped up level one and level two panels. I thought they were bee-rilliant, but after looking at them for so long while writing the game, I got boringly used to them. After heaps of tweaking, I love them again.



A guardian spits lighting at you in level one

Level one and two are coming along very nicely indeed. The 3D in level two is nice and fast and Nick has used as much colour as possible. Soon I shall be slapping in all Nick's new graphics for level two, then I'll decide what is needed alongside the eagle in level three.

As far as the introduction goes David Whittaker, the man who writes the music for all the best computer games, has been asked to write an amazing score, and Nick is going to draw an old haggard wizardy man the height of the screen. We will try to get the old man's lips and eyes to move as he reads out in digitised speech the story that sets the scene. We will also add a big flashy Probe cum Firebird logo.

Our only means of escape from the frantic hours of programming – when Nick gets to my house at a decent hour – is to go water skiing at Thorpe Park. It does my heart good to see Nick hit the surface of the lake at 30 knots as he yet again fails to negotiate the buoys. I reckon it's the extra weight of the air tanks and the mask steaming up that does it. He gets annoyed when I put on some Wet Wet Wet during the drive home...

And that's about it, except that Nick has regressed into a moon worshipper again and is complaining about drawing the eagle. Togh!

Board of the roms

Phil Craven can't see the wood for the chipboard

REALISING that more and more people are putting Arnold to serious work, and with sales of CPC rom-based software on the increase, Microgenic Systems has applied its considerable industrial experience and expertise to the home computer market by producing the Advanced Eprom Expansion Board.

The 7.5in x 5in unit is supplied uncased. It connects vertically to the CPC's expansion port – taking up less space at the rear of the machine than the monitor plugs – and has one through connector, allowing the use of other peripheral devices.

Because the expansion connector on the 464 is higher than the 6128's, two self-adhesive feet are provided for 464 owners with disc drives to add stability; the feet raise the level of the DDI-1 interface to that of the board's through connector.

When connected to a 6128, the board is suspended about an eighth of an inch above the desk top – higher on a 464 – and although it is very lightweight and normally stable, I can't help but wonder if an accidental strong push against the board might bend the CPC's mother board to the point of damaging it. It would take a very clumsy person, but it might be possible.

Switches are located across the top of the board in easy to use positions and the board itself is clearly printed with words and numbers, making their use obvious. A bank of eight switches allows each rom to be enabled or disabled individually, and another switch enables or disables the entire board. A red LED indicates when the board is enabled.

The bright red Reset button is a nice feature. At first I thought it was a waste, since we are all used to using the keyboard to reset the machine, but then it occurred to me that sometimes the machine hangs up and the Ctrl/Shift/Esc method doesn't work.

So I set up that condition and, sure enough, the Reset button did the job. The alternative is to remove any disc and power down.

It is a good habit never to operate switches while power is applied to rom boards as damage can occur, but all switches on this board are designed to be used with the power *on*. This means that individual roms, and even the whole board, can be switched in and out of circuit at any time without risk of damage.

On arrival the board is set up to accommodate roms 0 to 7 by a soldered-in link. For 464 and 664 owners these are the only background roms allowed, but a link option is incorporated for the 8 to 15 roms allowed on the 6128.

The link has to be made with a soldering iron and the original link either removed or cut. Although the linking holes have been designed so that a DIL switch can be soldered in, making low and high numbered rom banks switch-selectable, I feel that a slide-on/slide-off link would have been better.

Microgenic Systems says that most users would not require roms 8 to 15, and even this small saving helps to keep the price down. This is undoubtedly true, but the slide facility would have been better, particularly since 6128 owners – who are in the majority – can only use sockets 1 to 6, because sockets 0 and 7 are reserved for Basic and AmsDos.

The board is extremely well designed, as one would expect from a company with extensive industrial experience. All the logic chips are high speed, low powered CMOS HCT – ensuring that current drain on the CPC's power supply is negligible.

The buffered data bus and large area of ground plane – the amount of copper clad board at 0v – add to the board's overall reliability.

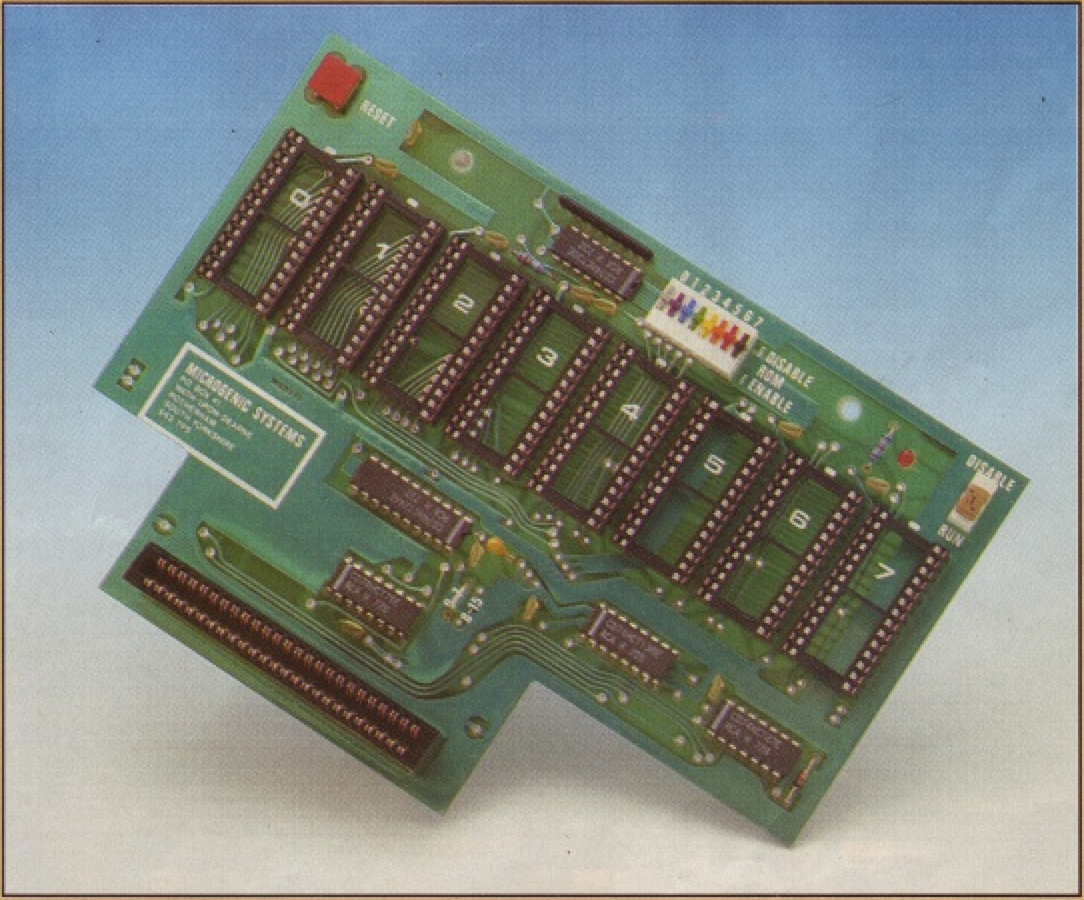
Microgenic Systems plans to follow the release of this board with an eprom programmer, which at the time of writing is already in the prototype stage. The two units will attach solidly to one another and holes are incorporated in the rom board for this purpose.

The verdict

While the lack of slide links for rom bank switching, and the remote possibility of damage due to clumsiness, are negative points, the excellent technical and functional design of the board with its well positioned and easy to use switches, the Reset button and the fact that its takes up virtually no desk space make it very good value.

Whether or not the lack of a casing is a plus or minus point is a matter of individual choice. Personally, it makes me feel rather clever having all those chips on display to visitors!

The Advanced Eprom Expansion Board for the CPC 464, 664 and 6128 costs £29.95 and is available from Microgenic Systems, P.O.Box 41, Wath upon Dearne, Rotherham, S63 7PS. Tel: 0709 829441.



The Advanced Rom Expansion Board from Microgenic Systems

Kiss me Kate

A one-armed Vax returns to hack and haunt between feeds and changes

I GOT one! I got a small squealing bundle called Kate Margaret Olliver, born on July 13 1988 at 8.21 in the morning. What an upheaval that was. You wouldn't recognise the front room now. Everything but the Swiss Cheese plant is covered in bottles of baby oil, baby wipes, monster packs of nappies and bins with foul-smelling contents.

You would not believe the amount of, er, "waste" this kid produces. I'm thinking of calling in Nirex, the UK atomic waste dispersal company. I've acquired bloodshot eyes with bonus black rings, and Suz's frontpieces have... *(That's enough of that. Congratulations, Suz. We all knew you had it in you – Ed.)*

All is happy, but hectic. Not only are there three months' letters to catch up on, but I occasionally get passed this damp screaming bundle, and Suz says "How about changing this then?" Hint for new fathers: The correct reply is "No thanks, I like the one we've got already".

Still, it is possible to swing a brat vigorously in one arm and type one-handed, so the column will now continue.

Hi there, fans. That's Graham B. and Lloyd T. of Oz I'm talking about (who wish to remain anonymous). They sent this parcel, you see, containing various pieces of circuitry, badges, an Australian tax return form, some write-only floppies and a razor, all in a model aircraft box.

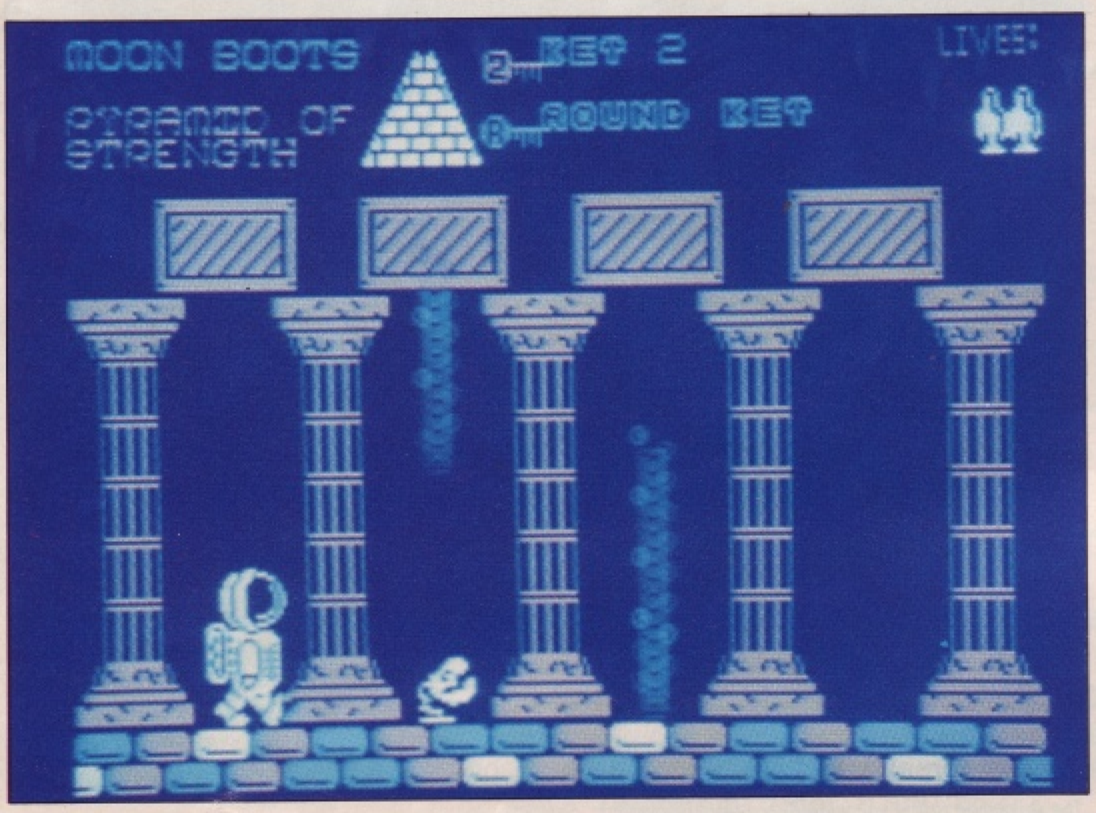
What happened to the model aircraft? That's what I want to know. Maybe you'll get something for extreme nerve. Maybe. Would you reward someone who thinks that VAX stands for Villainous Amstrad Xpert?

Game	Poke	Result
Anarchy	48E1,C9	Infinite lives
Agent X II	5CDA,A7	Infinite energy
Buggy Boy	5E7F,C9	Infinite time
Driller	6D87,6B	Infinite energy
Doors of Doom	85F6,A7	Infinite energy

Figure I: Multiface pokes

The holiday on the canal boat was great, and I even brought back a souvenir – a 10ft barge pole to not touch Manic Miner pokes with. In coming home though, I picked up the flu, and Suz went into hospital with high blood pressure (practice for when the brat arrived). Life got better afterwards, but I still wouldn't expect much in the way of big Hackers columns for another month or so.

Stacey Gray from Abingdon has written in with a few handy pokes for those lucky folks who own a Multiface. You'll find them in Figure I. The Doors of Doom poke only gives you infinite energy if you don't fire too much, but it will stop you being zapped by the androids.



Finally, if you poke Renegade at 0FE1 with FF, you won't fall off the subway platform. Thanks for the pokes Stacey. All your own work, I trust?

Rigel's Revenge

Ho hum, naughty me. Caught dipping me fingers in Lance Davis' letters bag again. Still, I'm sure David Hood of East Molesey won't mind me slightly lifting his instructions for a good half of Rigel's Revenge. The instructions take you up to No-man's-land. Progress on this or any other adventure is always welcomed at the Hacker's Haunt.

I, being above such pursuits of the mind, haven't got it meself, so I hope you lot can understand the instructions. Nine out of ten for spelling, three out of ten for punctuation, David. Anyway, yur tiz:

First, find the goggles and wear them. Get into the flat and examine the sink. Get the medikit and wear it. Climb up on to the sink and pull the bar hard. Press the red button (presumably the one on the medikit – HH) *and bend the bar. When you have run out of strength, press the green button. Remove anything, and throw the lot out of the window. Jump out after it. Get everything, and put your clothes back on.*

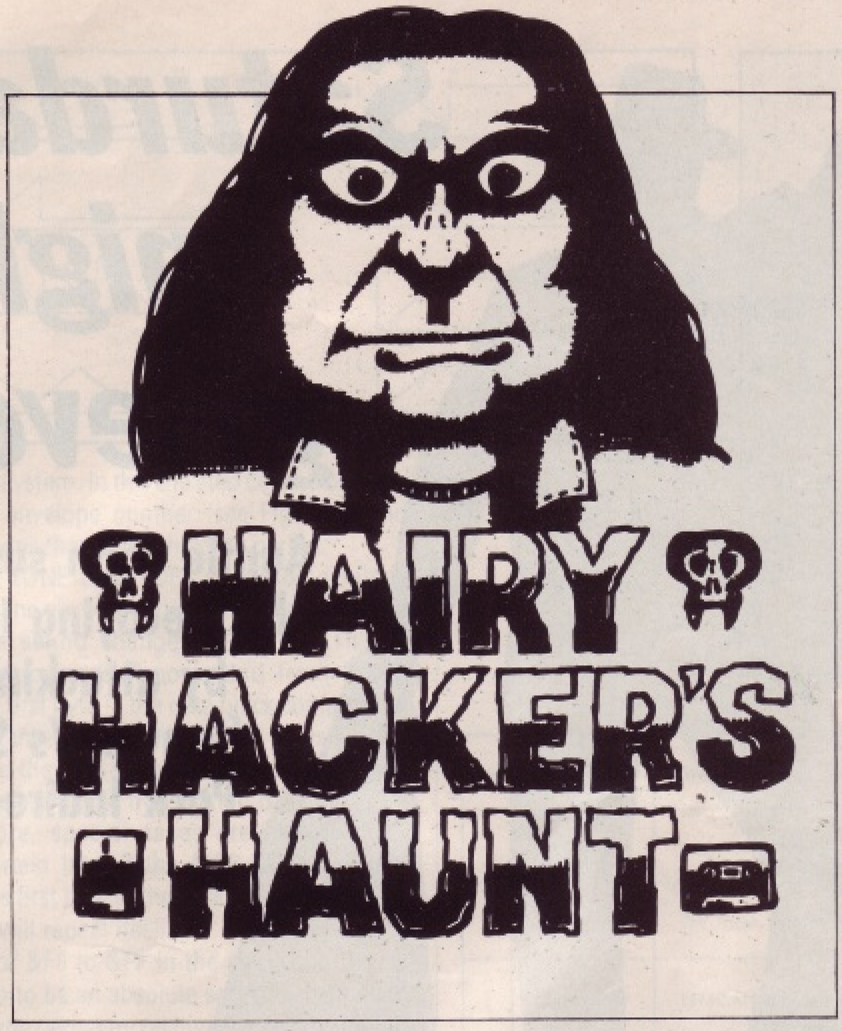
Get out of the alley and go to the hotel. Untie the wire on the door handle and open the door. Push the bed twice and get the gun that is hiding underneath it. Get the satchel from Elliot, it comes in handy later for putting things in.

Go into suburbia and nobody will jump on you because you have the gun. Get some rubble and climb a lamppost. Go east to get the screwdriver, then go east again to a bungalow. Throw the rubble at the security light and wear the goggles. Go east on to the porch and get the Rigellian uniform. Go back west again until you hit the bridge. Go up to the west perimeter and go west once more. Get the bone. (Guess who you're going to give this to – HH).

Now you type "Follow trucks to hotel" and you arrive back at the west perimeter. Go to the cul-de-sac and give the dog the bone. Some big dogs will now come after you. You avoid them by going to the robotank and then going south. The gun will fire and scare the dogs, while the caretaker robot will chase them. Press the green button and go south east, up onto the view-bridge. When you get to the gap, just jump over it. Go down on to the plaza and head north until you come to the camp. Get the robocopter to follow you.

Jump on to the dominator tank and press the dipswitch. The hatch will close and the helicopter will hit the tank. The impact makes the mine detector fall out of the cupboard. Go to the flanked office buildings and you will find a crater. In the crater there is a bomb which will not blow

A mini-poke for Metropolis from Stewart Russell. He's not sure exactly which keys are used, but pressing the area bounded by T, B, M and P usually produces it. Press small Enter, type in a number less than 30 on the top row numbers, and you're magically transported to that screen.



up unless you pick it up and drop it a number of times.

This is as far as David has got, any improvements?

Pair of Adam's

OK, enough of adventures – on with the more traditional sort of poke. Some from Adam Todd, in fact. You're quite lucky really, as this month's swatch very nearly ended up covered in partly-digested mummy- milk. Obviously my daughter appreciates neither good code nor attempts to burp her and load Locoscript at the same time.

Adam Todd has sold his 464 and upgraded to a 6128. I'll send you a few discs, Adam. His first poke is for Golden Talisman. It renders you indestructible and, as an added pretty, starts off with the bit where the dragon gets killed. Apparently, dragon slaughter is worth watching:

```
1 ' Golden Talisman
2 ' Indestructibility
3 ' Adam Todd
4 '
10 MODE 1:LOCATE 16,10:PRINT"TALISMAN"
20 MEMORY &12C0:tot=0
30 FOR b=&14B0 TO &14C7
40 READ a$:c=VAL("&"+a$)
50 POKE b,c:tot=tot+c:NEXT b
60 IF tot<>&787 THEN PRINT"Error":STOP
70 LOAD "!code",&14C8:CALL &14B0
80 END
90 DATA 26,23,6c,22,9c,26,24,2c
100 DATA 22,13,15,22,ae,51,af,32
110 DATA 32,40,32,f4,3d,cd,78,38
```

You'll love Adam's Destructo pokette, especially if you found the plane a trifle difficult to control. This 'un removes all the random wiggles thrown at the plane, and gives you more powerful bombs so as to sink everything quicker:

```
1 ' Destructo
2 ' No wiggles, big bombs
3 ' Adam Todd
4 '
10 tot=0
20 FOR b=&BF00 TO &BF28
30 READ a$:c=VAL("&"+a$)
40 POKE b,c:tot=tot+c:NEXT b
50 IF tot<>&11C6 THEN PRINT"Oops":STOP
60 CALL &BF17:RUN"":END
70 DATA 3e,c3,32,4f,3f,ee,4b,32
80 DATA 38,bd,af,32,84,3c,cd,37
90 DATA bd,af,06,01,c3,4d,bc,26
100 DATA bf,2e,00,3e,c3,32,4d,bc
110 DATA 22,4e,bc,ee,68,32,38,bd
120 DATA c9
```

Thanks again Adam, we'll see if the Ed can throw something together for you.

Knight Tyme

More adventurey tackle. Months ago, someone – and I apologise for forgetting just who – wanted to know how to make the transporter work in Knight Tyme. Well, A.Taylor (not just any old Taylor) has written in to tell thee and me how: Firstly, drop Gadget X, then get the invalid ID card and the glue. Then get the camera and instant film. Take off the cloak of invisibility, give the camera and instant film to Klink and command him to help take the photograph.

The ID card will now be valid. Wear it. Get the advert from Sharon and put it next to the weird shape. Jump on to the advert, then on to the weird shape. Take the star map and pewter tankard and give them to Gordon. All you have to do then is move the ship to Starbase 1, command Gordon to help, and the transporter will be fixed.

Justin's spot

And now a poke or two from Justin, who goes through code like a knife through hot butter. Poke one is for the tape version of Mickey Mouse and guarantees to keep your pistol and lives brimming.

```
1 ' Gremlin's Mickey Mouse (tape)
2 ' Infinite lives and water
3 ' (c) Justin for ACU
4 '
10 MODE 1:MEMORY 12345
20 tot=0
30 FOR n=&1600 TO &163F
40 READ a$:a=VAL("&"+a$)
50 POKE n,a
60 tot=tot+a
70 NEXT n
80 IF tot<>5859 THEN PRINT"Oh dear, th
   ere's an error in the data.":END
90 INPUT"Insert rewound Mickey Mouse t
   ape and press Enter.",a$
100 CALL &1600
110 DATA 3e,16,21,70,01,11,7c,02
120 DATA cd,a1,bc,0e,c0,21,98,01
130 DATA 11,54,02,cd,36,16,0e,6b
140 DATA 21,d0,01,11,1c,02,cd,36
150 DATA 16,21,2a,16,22,9c,02,c3
160 DATA b7,01,97,32,f9,64,c6,b7
170 DATA 32,e7,53,c3,00,32,7e,a9
180 DATA 77,23,1b,7a,b3,20,f7,c9
190 DATA 4a,55,53,54,49,4e
```

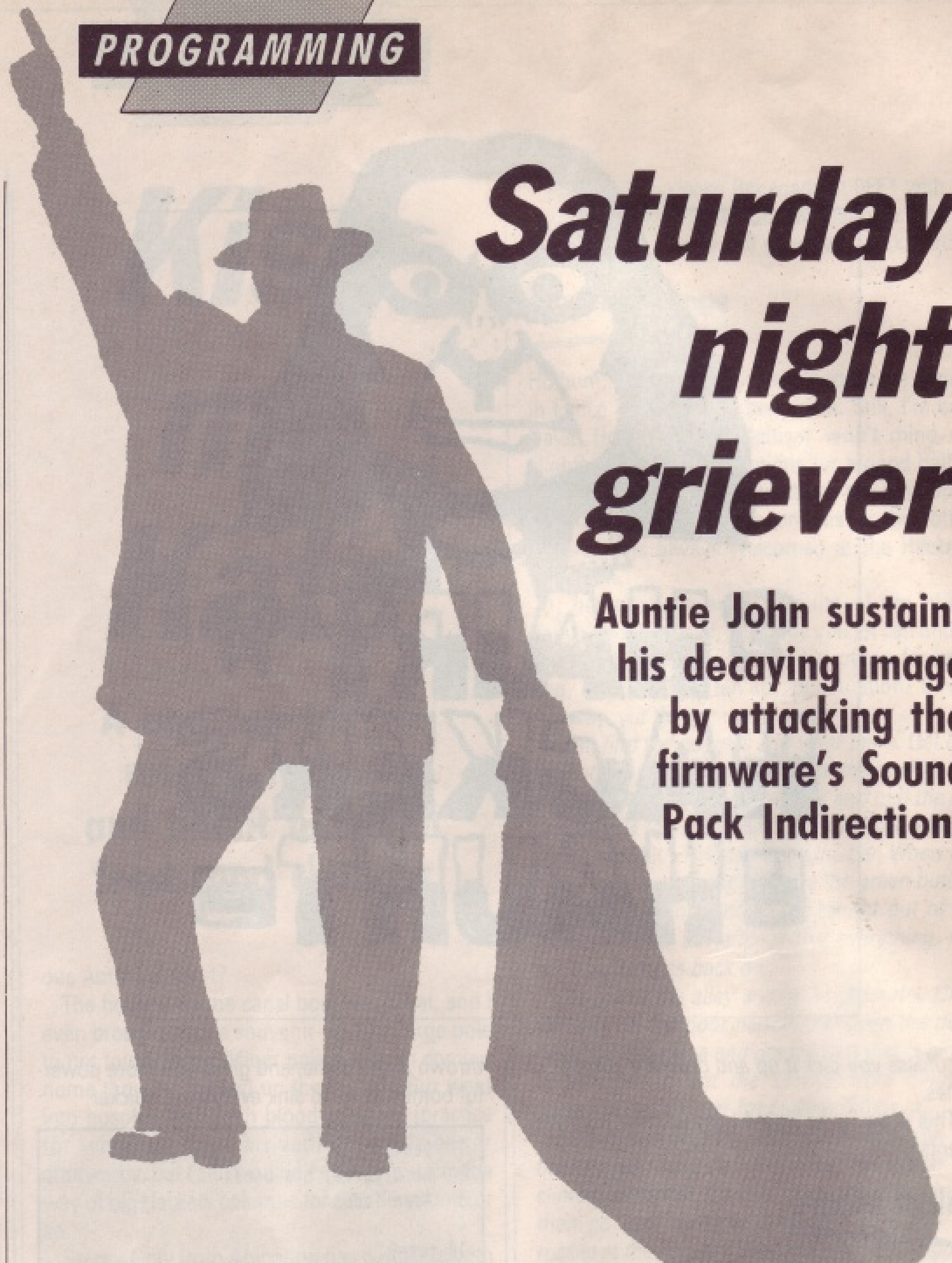
Justin's second poke is for Overlander. Bash the bikes, crash the cars, torch the tanks and never run out of life. All this and as much petrol as you can swallow:

```
1 ' Elite's Overlander (tape)
2 ' Infinite lives and fuel
3 ' (c) Justin for ACU
4 '
10 MODE 1:MEMORY 12345
20 tot=0
30 FOR n=&100 TO &115
40 READ a$:a=VAL("&"+a$)
50 tot=tot+a:POKE n,a
60 NEXT n
70 IF tot<>1873 THEN PRINT"There is an
    error in the data.":END
80 LOAD ""
90 CALL &100
100 DATA 21,09,01,22,51,a4,c3,00
110 DATA a4,af,32,15,1a,c6,18,32
120 DATA 13,05,c3,80,e3,4a
```

Unlike Justin's pokettes, not all programs are good enough to be published. One programmer worked on a thesaurus for eight months, only to have it turned down and a rival program used instead. He was said to be upset, distraught, deranged, perturbed, agitated, disturbed, fed up, disconcerted, flustered, stirred up, ruffled and generally cheesed off.

I leave you with a quote from a little-known computer marketing manager, given while someone was searching through his latest brochure: "Don't take it out just because it isn't true for chrissake!"

Luv, Vax, Suz and Kate.



Saturday night griever

Auntie John sustains his decaying image by attacking the firmware's Sound Pack Indirections

DRAT! I've just got a Read Error on my chocolate digestive biscuit. I knew I shouldn't have formatted it to hold 278k. It's all to do with the cheaper chocolate they are using these days. It was only a short time ago that you could safely dunk your biccies in hot tea and still get more than 300k of storage on them.

Sigh. So here I am, freaking out to Pink Floyd and wishing that when I played my synthesiser it wouldn't sound like a cross between New Order and a car accident. Sound, it seems, is easy to make, but difficult to make well. If you think you have mastered the Basic sound commands we are going to have some fun, because this month it is the firmware's Sound Pack Indirections that get the special AJ treatment.

The sound chip used in the Amstrad CPC machines is that old faithful, the General Instruments AY-3-8912. It was originally designed for use with the CP1600 – a CPU that has long since passed into obscurity.

The AY-3-8912 chip has an integral eight bit I/O port that is used in the CPCs to scan the keyboard. It also has several volume envelopes, and the CPC uses software interrupts to allow the use of tone envelopes. You can program the sound chip directly if you want, but to avoid nasty hang-ups a firmware call must be used.

Stop and start

Let's begin by looking at two of the simpler firmware calls – SOUND HOLD at &BCB6 and SOUND CONTINUE at &BCB9. These can be used to pause and continue any sounds being generated in mid-bleep. This can be useful if you are trying to write a Pause Game routine for your latest machine code game.

Listing I is the assembly code needed for a routine that you can easily add to your programs. If the Control key is pressed the routine pauses the sound and goes into a loop which is only left when the Copy key is pressed. Perhaps you could add some code to write "Game paused, press COPY to continue".

I must tell you this joke that Fiona's brother, Raymond, told me: Q. What do you call a Chinese woman with a food processor on her head? A. Blenda. Yes, well he thought it was funny and he drives a Fiesta, so he must have a good sense of humour...

The other firmware calls to set up envelopes and add the sounds to the sound queue are just like their Basic equivalents.

An important point to remember is that the data these routines need must not lie underneath a rom. I remember spending many long hours trying to debug a sound routine that refused to work simply because the data was not between addresses &4000 and &BFFF. Don't make the same mistake.

The first routine is SOUND QUEUE at &BCAA. This works in the same way as the SOUND keyword in Basic. You supply it with the address of the data in the HL register pair and it gets to work. But the data must be laid out in a specific order – one slightly different to Basic – and takes nine bytes of ram. The order of the data can be seen in Figure I.

The Channel and Rendezvous data byte works in exactly the same way as the Basic SOUND command, with channels numbered 1,2 and 4. A zero in the other data positions usually means use a default value.

The firmware call SOUND AMPL ENVELOPE at &BCBC sets up an amplitude envelope, which controls the volume of the sound produced. Just like SOUND QUEUE, it needs its data supplied in a block of memory pointed to by HL. For future reference it also needs an envelope number supplied in the A register. Fifteen such envelopes can be created.

An amplitude envelope contains one byte storing the number of three-byte sections that follow. There are a maximum of five sections. The bytes in a section control the step count, the step size and the pause time – again just like from Basic with ENV.

If the most significant bit (MSB) of the step count is set – that is, if 128 is added to the value – a hardware envelope is used. This is one generated solely by the sound chip itself, not the

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Channels and rendezvous data.	Amplitude envelope number. (0 to 15)	Tone envelope number.	Tone period. Two bytes are needed to give the required range. (0 to 4095)		Noise period. (0 to 31)	Initial amplitude of the volume. (0 to 15)	Two bytes to hold the duration. (0 to 32767)	

Figure I: The order of the data for SOUND QUEUE

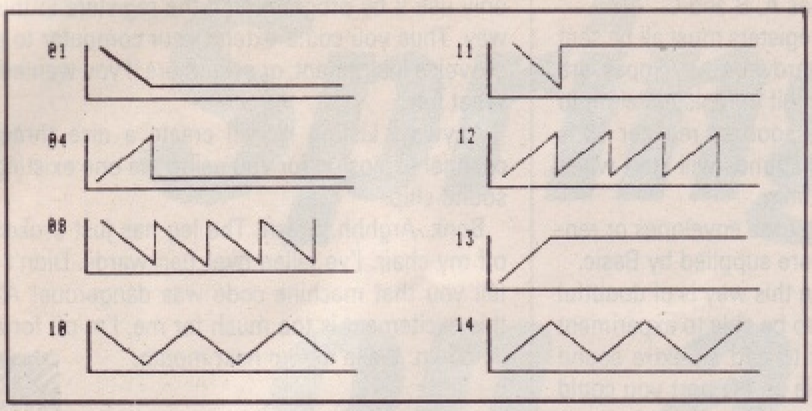


Figure II: Hardware envelopes

operating system. In this the step count holds the hardware envelope number (see Figure II) and the two bytes that follow hold its period.

SOUND TONE ENVELOPE at &BCBF similarly sets up a tone envelope – which controls how the pitch of a sound changes with time. This is equivalent to an ENT command from Basic. Again, the first byte in the data block contains the number of three-byte sections. The bytes in each section are the step count, the step size and the pause time – just like from within Basic.

As before, special cases are indicated by setting certain bits. If the MSB of the section count – the first byte in the data block – is set, the envelope will repeat itself.

Values of &F0 to &FF in the step count cause the section to be an absolute section – instead of changing the period by relative values, the period is changed immediately to the period held in the next two bytes.

Sometimes all this gets too much for me, so I chicken out and set up my envelopes from within a Basic loader program. This makes life a lot easier because the sounds can still be called from machine code.

Listing II sets up an envelope of each type, and then adds the sound to the Sound Queue. As the "flush queue" bit of the channel number is set, the sound happens immediately.

Bookends

Green is back from his Trans Europe Juggling Exhibition, and claims to have dropped one in every major capital city. Personal friends of Green will not find this very difficult to believe. This guy takes juggling to the ultimate in spectator sports, especially when he gets drunk and tries to juggle a knife, a pair of scissors and a cheese grater. Hope the skin grows back soon.

Another friend of mine comes straight from the sixties. Allow me to introduce you to the politically aware Chris the Hippy, who likes nothing better than to mellow-out with some Bob

```
; Pause Game routine.
; Intended to be called from within
; the main loop of a game.

test_key   equ &bb1e
hold_sound equ &bcb6
cont_sound equ &bcb9

.pausegame
ld a,23
call test_key               ;If CTRL not pressed
ret z                       ;then return from routine.
call hold_sound             ;Pause sound. .loop
ld a,9
call test_key
jr z,loop                   ;Loop until COPY pressed.
call cont_sound             ;Allow sound to continue.
ret                         ;Return from routine.

end
```

Listing I

Reg.	Function	Bits used
0	Cha A tone	Least Significant eight bits of period.
1	Cha A tone	The lower four bits contain tne higher order bits of the period.
2	Cha B tone	Least Significant eight bits of period.
3	Cha B tone	The lower four bits contain the higher order bits of the period.
4	Cha C tone	Least Significant eight bits of period.
5	Cha C tone	The lower four bits contain the higher order bits of the period.
6	Noise period	A value from 0 to 31.
7	Control Reg.	Bit 7: must be zero Bit 6: must be zero Bit 5: Reset means Noise on Cha C Bit 4: Reset means Noise on Cha B Bit 3: Reset means Noise on Cha A Bit 2: Reset means Tone on Cha C Bit 1: Reset means Tone on Cha B Bit 0: Reset means Tone on Cha A
8	Cha A vol.	The four LSB's contain the volume from 0-15. If the fifth bit is set the hardware envelope is used
9	Cha B vol.	The four LSB's contain the volume from 0-15. If the fifth bit is set the hardware envelope is used
10	Cha C vol.	The four LSB's contain the volume from 0-15. If the fifth bit is set the hardware envelope is used
11 12	Envelope period	Least Significant byte of period. Most significant byte of period.
13	Envelope No.	One of the seven different hardware envelopes (see Figure II).

Figure III: The sound chip registers

```
; Sets up an envelope of each type,
; and then adds the sound to the Sound Queue.

sound_queue    equ &bcaa
ampl_envelope equ &bcbc
tone_envelope equ &bcbf

ld a,1
ld hl,envdata
call ampl_envelope         ;Set volume envelope
ld a,1
ld hl,entdata
call tone_envelope         ;Set tone envelope
ld hl,sound_data
call sound_queue           ;Create sound
ret                        ;Return to Basic

; Sound data
envdata    db 1,15,-1,20                    ;Only one section.
entdata    db 130,10,10,1,10,-10,1          ;Two sections.
sound_data db 135,1,1,32,3,0,0,0,0

end
```

Listing II

Dylan and start revolutions in small countries. He also likes old people and children. He wants to run his own chain of fashion boutiques and be an air hostess.

Direct assault

To program the sound chip directly, the call MC SOUND REGISTER at &BD34 must be used. The A register contains the sound chip register to use, and C contains the data.

Figure III details the registers on the AY-3-8912, not including the I/O registers. The three sound channels are referred to as A, B and C.

To create a sound the registers must all be sent their set up values. If hardware envelopes are used – by setting the fifth bit in registers eight to 10 – the sound starts as soon as register 13 is written to, otherwise the sounds will start when the control register lets them.

Notice that there are no tone envelopes or rendezvous facilities; these are supplied by Basic.

Using the sound chip in this way is of doubtful importance, but it's nice to be able to experiment with it. If you happened to add an extra sound chip to your computer via an I/O port you could only use it by programming the registers in this way. Thus you could extend your computer to a six-voice instrument, or even more if you wanted. What fun.

Anyway, Listing III will create a nice three-channel explosion for you using the one existing sound chip.

Bonk. Arghhh. Crash. The leg has just broken off my chair. I've fallen over backwards. Didn't I tell you that machine code was dangerous! All this excitement is too much for me, I'm off for a lie down. Wake me up next month.

```
;
; Explosion.
;

sound_register equ &bd34

org    ;(you choose where - anywhere - even under a rom!)

ld a,6
ld c,31
call sound_register      ;Set noise period.
ld a,7
ld c,7                   ;That's 00000111 in binary.
call sound_register      ;Enable noise on all channels.
ld a,8
ld c,16
call sound_register      ;Enable envelopes Ch. A
ld a,9
ld c,16
call sound_register      ;Enable envelopes Ch. B
ld a,10
ld c,16
call sound_register      ;Enable envelopes Ch. C
ld a,11
ld c,255
call sound_register      ;Set LSB of envelope period.
ld a,12
ld c,25
call sound_register      ;Set MSB of envelope period.
ld a,13
ld c,1
call sound_register      ;Choose envelope and cause
                         ;sound to start.
ret                      ;Back to Basic.

end
```

Listing III

Spring on a Thing

A game for the CPC by Fredrik Nordbakke



THIS game is one mad dash against time to get from the bottom left of the screen to the top right as many times as possible. Jump through the holes to move up a platform, fall through the holes to avoid the arrows that pepper later levels. Falling through the lower platform will result in severe electrocution followed by a swift but painful death.

Time is represented by a slowly shortening column at the right of the screen. The more quickly you finish the level, the more your bonus will fill up. Each time you jump the bonus will decrease by 10. If you complete five levels without losing a life, the bonus will be added to your score.

The game should be run from a clean machine. The SYMBOL AFTER 32 in line 50 will prevent it being run again if it stops with an error message. You can restart the program after correcting typing errors by typing RUN 60.



The figures in the left hand column of the listing below show it has been checksummed by **ACU Proofreader**, the real-time type-in tester published in the September 1988 issue of *Amstrad Computer User*. You don't need **ACU Proofreader** to be able to run this listing, but having it makes spotting typing errors very easy.

```
[F1] 10 'Spring on a Thing
[F2] 20 'by Fredrik Nordbakke
[F3] 30 '
[9F] 40 INK 3,9:MODE 1
[30] 50 SYMBOL AFTER 32
[32] 60 b$="BONUS":v%=74:h%=75:o%=72:D
     IM r%(7):n%(1)=1:n%(3)=1:n%(6)=1:
     ad=35000:MEMORY ad
[4F] 70 DIM L(11),L$(11),L1$(11):FOR n
     =1 TO 10:L$(n)="AMSTRAD...":L1$(n
     )="00100":L(n)=100:NEXT
[5E] 80 GOSUB 1430:GOSUB 1530
[F9] 90 ' menu screen
[69] 100 INK 0,1:INK 1,26:INK 2,6:PAPE
     R 0:CLS:PAPER 3:BORDER 1:SOUND 13
     5,0
[2F] 110 PEN 1:LOCATE 11,1:PRINT" SPRI
     NG ON A THING "
[23] 120 WINDOW 11,29,4,13:PAPER 2:CLS
     :FOR n=1 TO 10:PRINT L$(n);"...."
     ;L1$(n);:NEXT:WINDOW 1,40,1,25:PA
     PER 0
[BB] 130 PEN 1:LOCATE 11,16:PRINT"P -
     PLAY THE GAME":PRINT:PRINT TAB(11
     )"K - KEYBOARD":PRINT:PRINT TAB(1
     1)"J - JOYSTICK":PRINT:PRINT TAB(
     11)"I - INSTRUCTIONS":PRINT:PRINT
      TAB(11)"Q - QUIT"
[CE] 140 RESTORE 1640:FOR n=1 TO 87
[9C] 150 IF INKEY(67)<>-1 THEN MODE 2:
     PAPER 0:PEN 1:INK 0,0:INK 1,26:BO
     RDER 0:CLS:SOUND 135,0:WHILE INKE
     Y$<>"":WEND:END
[88] 160 IF INKEY(35)<>-1 THEN SOUND 1
     35,0:GOTO 1220
[3C] 170 IF INKEY(45)<>-1 THEN v%=74:h
     %=75:o%=72
[08] 180 IF INKEY(37)<>-1 THEN v%=8:h%
     =1:o%=0
[5F] 190 IF INKEY(27)<>-1 THEN SOUND 1
     35,0:GOTO 270
```

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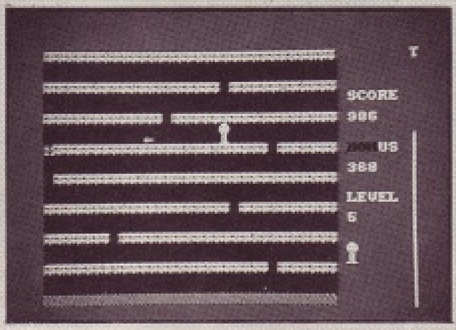
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R213

```
[B5] 200 READ p,d
[3E] 210 f=440*(2^(1+((p-10)/12)))
[9E] 220 p1=ROUND(125000/f)
[74] 230 SOUND 1,p1,d*0.5,15:SOUND 2,p
     1+2,d*0.5,15:SOUND 4,p1+4,d*0.5,1
     5
[E2] 240 NEXT n
[DE] 250 FOR n=1 TO 500:NEXT
[15] 260 GOTO 140
[1F] 270 CLS:INK 0,0:INK 1,21:INK 2,25
     :BORDER 9
[4C] 280 po=0:bo=0:br=1:br1%=1:Li=3:bo
     1=0:va%=20
[8D] 290 GOSUB 1360
[7E] 300 x%=1:y%=20:ti%=378:tx%=32:rx%
     =1:ty%=3:tx1%=31:ty1%=3
[E2] 310 FOR n%=1 TO 7:a%(n%)=INT(RND*
     7)+1:b%(n%)=INT(RND*31)+1:LOCATE
     b%(n%),n%*3+1:PRINT" ":NEXT
[F9] 320 IF b%(7)=1 THEN b%(7)=2:PEN 1
     :LOCATE 1,22:PRINT CHR$(202):PEN
     2:LOCATE 2,22:PRINT" "
[44] 330 FOR n=1 TO 1000:NEXT
[F3] 340 FOR n=200 TO 100 STEP -2:SOUN
     D 1,N,2,15:NEXT:FOR n=100 TO 200
     STEP 2:SOUND 1,N,2,15:NEXT
```




```
[2C] 350 PEN 2:EVERY va% GOSUB 1200
[AF] 360 ' main loop
[49] 370 x1%=x%:y1%=y%
[7B] 380 ON INKEY(o%)+1 GOTO 650
[48] 390 x%=x%+(1 AND (INKEY(h%)=0 AND
      x%<31))-(1 AND (INKEY(v%)=0 AND
     x%>1))
[CD] 400 ON (x%=31 AND y%=2)+2 GOTO 11
     00
[6B] 410 ON (tx%=x% AND ty%=y%+1)+2 GO
     TO 860
[C1] 420 LOCATE x1%,y1%:PRINT" ":LOCAT
     E x1%,y1%+1:PRINT" "
[3D] 430 LOCATE x%,y%:PRINT CHR$(200):
     LOCATE x%,y%+1:PRINT CHR$(201)
[22] 440 FOR n%=1 TO 7:a%(n%)=a%(n%)+1
     :ON va%-a%(n%) GOSUB 820
[3A] 450 NEXT
[C1] 460 ON n%(br1%) GOTO 480
[E1] 470 ON rx% GOTO 540,580
[FC] 480 L%=(y%+2)/3:ON (x%=b%(L%) AND
      y%+2=L%*3+1)+2 GOTO 760
[91] 490 ON (ti%<=0)+2 GOTO 860
[41] 500 GOTO 370
[A7] 510 ' chr test
[E6] 520 CALL ad+1:ch%=PEEK(ad):RETURN
[AB] 530 ' <-- arrow
[EB] 540 tx%=tx%-1:ON (tx%=x% AND ty%=
     y%+1)+2 GOTO 860
[F7] 550 LOCATE tx1%,ty1%:PRINT" ":LOC
     ATE tx%,ty%:PRINT CHR$(204):tx1%=
     tx%:ty1%=ty%:ON (tx%=1)+2 GOSUB 6
     10
[62] 560 GOTO 480
[B3] 570 ' --> arrow
[DB] 580 tx%=tx%+1:ON (tx%=x% AND ty%=
     y%+1)+2 GOTO 860
[90] 590 LOCATE tx1%,ty1%:PRINT" ":LOC
     ATE tx%,ty%:PRINT CHR$(205):tx1%=
     tx%:ty1%=ty%:ON (tx%=31)+2 GOSUB
     610
[57] 600 GOTO 480
[F4] 610 L%=INT(RND*7)+1:ty%=L%*3:IF R
     ND>0.5 THEN rx%=1:tx%=32 ELSE rx%
     =2:tx%=0
[52] 620 SOUND 2,75,2,15
[C6] 630 RETURN
[AE] 640 ' jump
[6A] 650 bo=bo-10:IF bo<0 THEN bo=0
[46] 660 PAPER 3:LOCATE 32,12:PRINT bo
     :PAPER 0
[FE] 670 LOCATE x%,y%-1:GOSUB 520
[E3] 680 ON (ch%)-31 GOTO 710
[B2] 690 SOUND 1,300,5,12
[2D] 700 LOCATE x%,y%:PRINT" ":LOCATE
     x%,y%+1:PRINT CHR$(200):FOR m=1 T
     O 100:NEXT:LOCATE x%,y%:PRINT CHR
     $(200):LOCATE x%,y%+1:PRINT CHR$(
     201):GOTO 390
[4B] 710 LOCATE x%,y%:PRINT" ":LOCATE
     x%,y%+1:PRINT CHR$(200):FOR n=1 T
     O 50:NEXT
[93] 720 FOR n=y% TO y%-3 STEP -1:LOCA
     TE x%,y1%+1:PRINT" ":LOCATE x%,N:
     PRINT CHR$(200):LOCATE x%,n+1:PRI
     NT CHR$(201):SOUND 1,200+(N*50),5
     ,15:FOR m=1 TO 50:NEXT:y1%=n:NEXT
     :y%=n+1:SOUND 1,500,5,12
[77] 730 L%=(y%+2)/3:a%(L%)=0:LOCATE x
     %,y%+2:PEN 1:PRINT CHR$(202):PEN
     2:b%(L%)=INT(RND*31)+1:LOCATE b%(
     L%),y%+2:PRINT" "
[4B] 740 GOTO 370
[B1] 750 ' down
[82] 760 FOR n=y% TO y%+3:LOCATE x%,y1
     %:PRINT" ":LOCATE x%,N:PRINT CHR$
     (200):LOCATE x%,n+1:PRINT CHR$(20
     1):SOUND 1,200+(N*50),5,15:FOR m=
     1 TO 50:NEXT:y1%=n:NEXT:y%=n-1
[A1] 770 L%=((y%+2)/3)-1:a%(L%)=0:LOCA
     TE x%,y%-1:PEN 1:PRINT CHR$(202):
     PEN 2:b%(L%)=INT(RND*31)+1:LOCATE
      b%(L%),y%-1:PRINT" "
[48] 780 ON (y%=23)+2 GOTO 860
[CD] 790 SOUND 1,500,5,12
[59] 800 GOTO 480
[AA] 810 ' hole
[EE] 820 LOCATE b%(n%),n%*3+1:PEN 1:PR
     INT CHR$(202):PEN 2
[12] 830 b%(n%)=INT(RND*31)+1:a%(n%)=0
     :LOCATE b%(n%),n%*3+1:PRINT" "
[CA] 840 RETURN
[B2] 850 ' miss
[9B] 860 Q=REMAIN(0):Li=Li-1:IF Li=0 T
     HEN 930
[91] 870 SOUND 1,500,150,15,0,0,31:FOR
      n=1 TO 30:BORDER RND*28:FOR m=1
     TO 30:NEXT:NEXT:BORDER 9:FOR n=1
     TO 500:NEXT
[C7] 880 bo1=0:PAPER 3:LOCATE 33,10:PR
     INT"BONUS":bo=0:LOCATE 33,12:PRIN
     T"0    ":PAPER 0
[22] 890 LOCATE 33+Li*2,20:PAPER 3:PRI
     NT" ":LOCATE 33+Li*2,21:PRINT" ":
     PAPER 0:br2%=br1%
[52] 900 LOCATE x%,y%:PRINT" ":LOCATE
     x%,y%+1:PRINT" ":LOCATE x1%,y1%:P
     RINT" ":LOCATE x1%,y1%+1:PRINT" "
     :IF n%(br2%)=0 THEN LOCATE tx%,ty
     %:PRINT" ":LOCATE tx1%,ty1%:PRINT
     " "
[70] 910 PEN 1:FOR n%=1 TO 7:LOCATE b%
     (n%),n%*3+1:PRINT CHR$(202):NEXT:
     PEN 2:GOSUB 1400:GOTO 300
[AD] 920 ' game over
[F2] 930 FOR n=100 TO 500 STEP 5:SOUND
      1,N,2,15:SOUND 2,n+2,2,15:SOUND
     4,N-2,2,15:NEXT
[E3] 940 FOR n=1 TO 500:NEXT
[C6] 950 SOUND 1,300,300,15,0,0,31:FOR
      n=1 TO 500:BORDER RND*28:NEXT:BO
     RDER 9
[50] 960 FOR n=1 TO 1000:NEXT
[B0] 970 IF po<L(10) THEN 100
[B0] 980 PAPER 3:CLS:LOCATE 6,4:PRINT"
     C O N G R A T U L A T I O N S!":P
     RINT:PRINT:PRINT TAB(9)"YOU HAVE
     GOT A HI-SCORE!":PRINT:PRINT:PRIN
     T
[04] 990 FOR n=1 TO 3:SOUND 7,300,40,1
     4:FOR m=1 TO 200:NEXT:SOUND 7,200
     ,40,14:FOR m=1 TO 250:NEXT:NEXT:S
     OUND 7,100,100,14:FOR n=1 TO 1500
     :NEXT
[73] 1000 WHILE INKEY$<>"":WEND
[D1] 1010 PRINT"NAME:";:PEN 1:LINE INP
     UT I$:I$=UPPER$(I$):I$=LEFT$(I$,1
     0):IF LEN(I$)<10 THEN I$=I$+STRIN
     G$(10-LEN(I$),".")
[B6] 1020 FOR n=10 TO 1 STEP -1
[EF] 1030 IF po>L(n) THEN 1040 ELSE FO
     R m=9 TO n+1 STEP -1:L(M+1)=L(M):
     L$(M+1)=L$(M):L1$(M+1)=L1$(M):NEX
     T:L(n+1)=po:L$(n+1)=I$:n=n+1:GOTO
      1060
[F8] 1040 NEXT
[B5] 1050 FOR n=9 TO 1 STEP -1:L(n+1)=
     L(n):L$(n+1)=L$(n):L1$(n+1)=L1$(n
     ):NEXT:L(1)=po:L$(1)=I$:n=1
[18] 1060 q$=STR$(po):q$=RIGHT$(q$,LEN
     (q$)-1):IF LEN(q$)<5 THEN q$=STRI
     NG$(5-LEN(q$),"0")+q$
[7D] 1070 L1$(n)=q$
[5E] 1080 GOTO 100
[9C] 1090 ' next level
[90] 1100 q=REMAIN(0)
[C7] 1110 LOCATE x1%,y1%:PRINT" ":LOCA
     TE x1%,y1%+1:PRINT" ":LOCATE x%,y
     %:PRINT CHR$(200):LOCATE x%,y%+1:
     PRINT CHR$(201)
[98] 1120 PAPER 3:FOR n%=ti% TO 0 STEP
      -2:SOUND 1,n%+10,2,15:PLOT 614,n
     %,3:PLOT 616,n%,3:po=po+2:bo=bo+2
     :LOCATE 32,7:PRINT po:LOCATE 32,1
     2:PRINT bo:NEXT
[3E] 1130 bo1=bo1+1:LOCATE 32+bo1,10:P
     EN 0:PRINT MID$(b$,bo1,1):PEN 2:S
     OUND 1,50,10,15
[B4] 1140 IF bo1=5 THEN bo1=0:FOR n%=b
     o TO 0 STEP -10:SOUND 1,n%+10,3,1
     5:po=po+10:LOCATE 32,7:PRINT po:L
     OCATE 32,12:PRINT n%:NEXT:bo=0:LO
     CATE 33,10:PRINT"BONUS":LOCATE 33
     ,12:PRINT"0    "
[CF] 1150 IF po>99999 THEN po=0:LOCATE
      33,7:PRINT"0     "
[A2] 1160 br=br+1:LOCATE 32,17:PRINT b
     r
[12] 1170 br2%=br1%:br1%=br1%+1:IF br1
     %=9 THEN br1%=1:va%=va%-1:po=po+1
     000:LOCATE 32,7:PRINT po:SOUND 1,
     300,50,14:SOUND 1,200,50,14:SOUND
      1,100,75,14:FOR n=1 TO 750:NEXT:
     IF va%<9 THEN va%=9
[A2] 1180 PAPER 0:GOTO 900
[9E] 1190 ' time
[2C] 1200 ti%=ti%-2:PLOT 614,ti%,3:PLO
     T 616,ti%,3:RETURN
[88] 1210 ' instructions
[BC] 1220 CLS:PAPER 3:LOCATE 11,1:PRIN
     T"SPRI[illegible]NG":PAPER 0
[5A] 1230 P[illegible]
[6F] 1240 PR[illegible]TASK IN THIS GAM
```

```
     E IS TO GET UP TO THE RIGHT SIDE
     OF THE SCREEN. AVOID THE HOLES IN
      THE GROUND. LOOK OUT FOR THE   A
     RROW AND REMEMBER THE TIME."
[60] 1250 PRINT
[BB] 1260 PRINT" EACH TIME YOU JUMP TH
     E BONUS WILL      DECREASE BY 10.
      IF YOU MANAGE 5 LEVELS  WITHOUT
     LOSING A LIFE, THE BONUS WILL   B
     E ADDED TO YOUR SCORE."
[66] 1270 PRINT
[63] 1280 PRINT" THE GAME WILL BE MORE
      DIFFICULT AFTER  PLAYING FOR A W
     HILE."
[46] 1290 PRINT:PRINT:PRINT
[4B] 1300 PRINT"   USE A JOYSTICK OR T
     HE CURSOR KEYS"
[56] 1310 PRINT
[79] 1320 PAPER 3:LOCATE 8,25:PRINT"PR
     ESS ANY KEY TO CONTINUE!"
[E2] 1330 WHILE INKEY$<>"":WEND:WHILE
     INKEY$="":WEND
[D0] 1340 SOUND 1,200,10,15:GOTO 100
[96] 1350 ' the screen
[81] 1360 PAPER 0:CLS:WINDOW 32,40,1,2
     5:PAPER 3:CLS:WINDOW 1,40,1,25
[19] 1370 PEN 2:LOCATE 39,1:PRINT"T":L
     OCATE 33,5:PRINT"SCORE":LOCATE 33
     ,10:PRINT"BONUS":LOCATE 33,20:PRI
     NT CHR$(200);" ";CHR$(200);" ";CH
     R$(200):LOCATE 33,21:PRINT CHR$(2
     01);" ";CHR$(201);" ";CHR$(201):L
     OCATE 33,7:PRINT"0":LOCATE 33,12:
     PRINT"0"
[3C] 1380 LOCATE 33,15:PRINT"LEVEL":LO
     CATE 33,17:PRINT"1"
[B0] 1390 PEN 1:PAPER 0:LOCATE 1,1:PRI
     NT STRING$(31,202):FOR n%=4 TO 22
      STEP 3:LOCATE 1,n%:PRINT STRING$
     (31,202):NEXT n%:LOCATE 1,25:PRIN
     T STRING$(31,127)
[93] 1400 FOR n%=0 TO 376 STEP 2:PLOT
     614,n%,2:PLOT 616,n%,2:NEXT n%
[66] 1410 RETURN
[8F] 1420 ' udg
[DA] 1430 SYMBOL 200,&X111100,&X111111
     0,&X11011011,&X11011011,255,&X110
     11011,&X1100110,&X111100
[08] 1440 SYMBOL 201,&X100100,&X111100
     ,&X100100,&X111100,&X100100,&X111
     100,&X100100,255
[0C] 1450 SYMBOL 202,255,255,&X1100111
     0,&X10011101,&X11110111,255,&X110
     11110,&X10001100
[D6] 1460 SYMBOL 203,0,0,0,&X1000000,&
     X10111111,&X1000001
[53] 1470 SYMBOL 204,0,0,&X100000,&X10
     00000,255,&X1000000,&X100000
[1D] 1480 SYMBOL 205,0,0,&X100,&X10,25
     5,&X10,&X100
[31] 1490 SYMBOL 206,0,0,&X11000000,&X
     100000,255,&X100000,&X11000000
[6A] 1500 SYMBOL 207,0,0,&X11,&X100,25
     5,&X100,&X11
[68] 1510 RETURN
[91] 1520 ' machine code
[61] 1530 a1=INT(ad/256):a2=ad-256*a1
[A2] 1540 RESTORE 1610
[BF] 1550 FOR n=ad TO ad+13
[16] 1560 READ a3:IF a3=999 THEN a3=a2
[46] 1570 IF a3=998 THEN a3=a1
[D2] 1580 POKE n,a3
[4B] 1590 NEXT n
[67] 1600 RETURN
[5F] 1610 DATA 0,62,244,50,999,998,205
     ,96
[50] 1620 DATA 187,208,50,999,998,201
[96] 1630 ' music
[C2] 1640 DATA 1,80,4,80,8,80,9,80,0,8
     0,1,40,8,80,6,80,6,80,5,80,4,80,3
     ,40
[B7] 1650 DATA 2,40,1,40,0,40,-4,40,1,
     40,6,40,4,80,3,80
[8E] 1660 DATA 1,80,4,80,8,20,6,20,8,2
     0
[C6] 1670 DATA 13,20,8,20,4,20,3,20,4,
     20
[36] 1680 DATA 6,20,8,20,10,20,12,20,1
     3,20,4,20,6,20
[3B] 1690 DATA 8,20,9,20,3,20,4,20,6,2
     0,8,20
[BC] 1700 DATA 6,20,4,20,3,20,4,20,6,2
     0,8,20
[4C] 1710 DATA 9,20,11,20,9,20,8,20,6,
     20,8,20
[37] 1720 DATA 9,20,11,20,13,20,14,20,
     11,20,9,20
[63] 1730 DATA 8,20,10,20,12,20,13,20,
     15,20,16,20,13,20
[CF] 1740 DATA 11,20,9,20,12,20,13,20,
     15,20,16,20
[31] 1750 DATA 18,20,15,20,8,20,15,20,
     13,20,15,20
[A9] 1760 DATA 16,20,18,20,16,20,15,20
     ,13,20,12,20,13,40,8,40,4,40,1,40
```



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Seek and ye shall find

Delve into adventures with Bill Brock

DO you feel that your luck has been running a little thin lately? Have too many things been getting you down? Has the scarcity of top notch adventures for your Amstrad been worrying the hell out of you? If the answer to all three is yes and if your Amstrad is a 6128, then Magnetic Scrolls' Jinxter is the solution to your problems.

Jinxter is all about luck, or rather the diminishing quantity of it. On a world not far away, there are people just like us. They have the same modern conveniences as we do, many of the same everyday problems, and a race of immortal guardians to watch over them and save them from their own stupidity.

They also have a number of green witches who strive to reverse the good done by the guardians. The balance had always been precarious until a master magician, Turani, created a magic bracelet that inhibited the evil magic of the witches.

Although the bracelet has a power of its own, the real strength of its magic lies in the small charms attached to it. The witches have finally developed a spell that can destroy the bracelet but not the charms.

By persuasion or bribery, the witches have managed to get several nameless persons to remove and hide the magic charms. The decrease in the bracelet's power has caused an increase in the bad luck the witches can dispense. This in turn has overloaded the guardians, who have to turn for help to you.

Having just been saved by a guardian from a near lethal bit of bad luck, you are recruited to find the charms and restore the bracelet to its full powers. Shortly afterwards, you get a telephone call for help from an old friend, Xam. It turns out that he has stumbled on what is happening and has already rescued one of the magic charms. The green witches find out and kidnap him. so along with your other little problems, you must find and rescue Xam.

Excellent puzzles

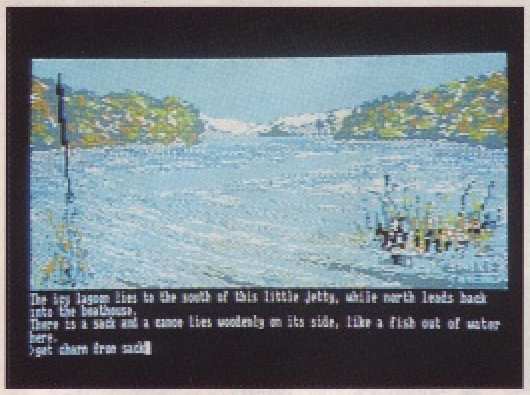
THERE are some excellent graphics in Jinxter, but it is the puzzles that make it a gem to play. They are not all easy to solve but a set of encoded clues are included for those that need a little help.

Initially you are on your way home on a bus. The first puzzle is to get off the bus at the right place. Check your inventory, look around, remain calm and all should work out OK. After leaving the bus you will be met by the guardian mentioned above. He has an obsession, as do all his race, with cheese sandwiches and is nattily dressed in the latest of herring bone suits. You may not have guessed it from the plot, but there is plenty of humour amid the serious business of saving the world.

Once inside your house, look around carefully and EXAMINE everything. Do not forget that Magnetic Scrolls is renowned for the adaptability of its parser. It can handle all sorts of commands that involve looking in and under things.

You are permitted to carry quite a few items





Looking for the canoe in Jinxter

around with you, so take advantage of this, you never know what might come in handy. For a good deal of the time you can move backwards and forwards freely through the locations. There is no penalty on the number of moves that you take – other than to your ego.

First you must find your way to Xam's house. This involves getting past a ferocious looking bull. What don't you usually do to bulls? Alternatively you could try and solve the problem of the barbed wire. At Xam's there are several puzzles to solve, one of which is getting a parcel out of



On the bridge in Jinxter

his locked mail box. You may have to approach the solution to this one twice before you solve it.

From here you can look forward to a leisurely paddle on the lake – once you have repaired the canoe. After a few interesting visits to unexpected places you can cross the lake to the village. Here you may find a couple more of those cute little charms. The order in which the hints are listed will give you a clue as to what to do next, so visit the clockmaker last.

You may find something soft to sit on before the pace hots up, but be prepared to run if you have to. Once in the green witches' castle you are nearly there, but stay clear of the chief witch, Jannedor, who is not a friendly soul.

Dumb parser

THE descriptive text in Jinxter is good and maintains the pace and atmosphere of this most amusing game. The parser has always been Magnetic Scrolls' trump card, but sometimes it can appear to be a little dumb and needs commands spelled out in full. A command like WATER PLANT may not be accepted, whereas WATER PLANT WITH WATER will.

I also think if I own a bunch of keys I should know which key to use without having to spell out that I want to open the front door with the front door key rather than the shed key.

Jinxter is a fun adventure, and will be enjoyed by anyone with the slightest hint of a sense of humour. With its sensible clues you do not have to be a red hot solver of puzzles to enjoy it to the full.

Finally, let us make a plea to the patron saint of all adventurers, Saint Wowo Chorder, to intercede on our behalf to Ms Sinclair of Magnetic Scrolls: Let there be expanded CPC464 versions in the future, don't restrict this heavenly manna to the brethren of the CPC6128.



Celtic crossing

AS regular readers will be aware, a certain Charles Sharpe has been mentioned in dispatches quite often of late. He must surely be one of our most prolific adventure writers. This time his offering was found in W.H.Smiths on a budget compilation tape from Top Ten Software under the somewhat strange name of Bogies Pick 3.

The adventure is called Druids Moon and the other three games are Stock Exchange, Darkwurlde and Herbert's Dummy Run. The latter was a hit in its own right when released by Mikro-Gen, so the tape has to be good value for money wherever your interests lie.

Druids Moon brings back Tommy Astle, the hero from one of Charles' earlier games, Werewolf Simulator. We learn that Tommy has always had an interest in the magic and culture of the Druids. Now, with an intense feeling of being called by someone or something, he has travelled into the depths of the English countryside to learn his fate.

He is staying at an olde worlde inn at Avenbury. It is here that we join him at the start of an adventure that may well change his whole life.

Mapping is not quite so devious as in Werewolf Simulator, but you must still take care to explore the terrain with pencil and paper at hand. Exploring the surrounding roads and woods, you realise that there is more to Avenbury than first meets the eye. The number of locations is not very large, but it is what you do in these locations that is going to be vitally important.

As with other games from the same author, useful items are not obvious, you must actively look for them. The first location is a good example: There are many useful things just lying around or within view, but you must SEARCH, EXAMINE, LOOK IN and LOOK UNDER everything you can think of to find what is there.

The program is written using Incentive's Graphic Adventure Creator and has the usual limitations of graphic design and parser. With that in mind, the graphics are an improvement over earlier adventures and the parser will accept sufficiently complex commands to make life a little interesting.

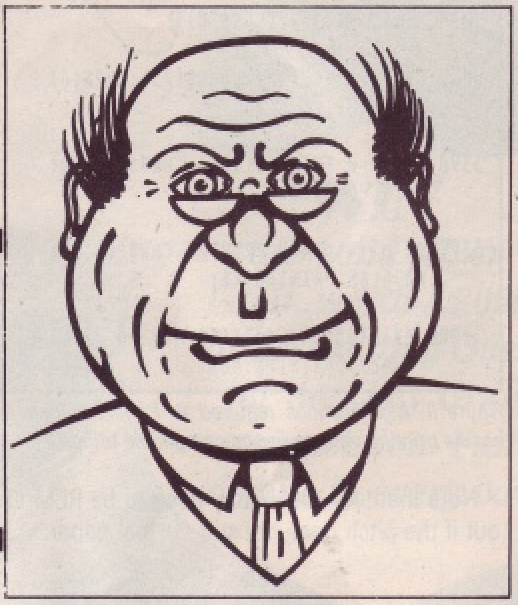
The amount of descriptive text is limited but still sets the scene adequately. The atmosphere is more in the mind than on the screen and builds quite nicely to the climax, which has a nice twist.

There can be no comparison between the elegant operation of something like Jinxter or Knight Orc and Druids Moon, but then there is a great difference in price. GAC games are still fairly common and represent much of the bread and butter for our adventure appetites. Long may they be so.

Ratings	Jinxter	Druids Moon
Plot	75	60
Atmosphere	73	58
Addiction	77	65
Difficulty	65	60
Overall	75	61

Applications advice

David Foster answers your questions and assesses two product upgrades



THANKs are due to all the people who have written in about the Serial 8056 printer and the solution to its printing problems. Can I please stress once more that I do not have the time to reply to individual letters – I do have a job as well – so please don't send me stamped addressed envelopes unless I ask for them in connection with a special listing.

Small Trader's Pack

I reviewed early versions of the Small Trader's/Invoicer packs produced by SD Microsystems in the April issue of *ACU* and, though applauding the idea behind them, I was far from complimentary about the way they worked.

SD Microsystems was understandably not very happy about the review and criticised it as not mentioning any of the good points. My comments were actually based on my experience of running small businesses over the last 20 or so years, during which time I have always done the day to day book-keeping.

The latest versions of these two programs have now arrived on my desk to assess, and I find that nearly every point I criticised has been changed; v2.3 has undergone a dramatic transformation. I assume that SD Microsystems felt that the criticisms were to some extent justified.

Whereas previously there was no check on the length of data being input, the current version now checks and rejects in most cases any over-length entries; under certain circumstances input is truncated.

Screen display is much improved, though I would still prefer the program not to switch between all three screen modes. Menu selection has been tidied up a lot and most options can now be selected with a single keypress, which is how it ought to be. One of my main criticisms was the inclusion of Delete options in the program. I am pleased to say that these have been removed. Instead, a Start New Period option has been provided. I also criticised the lack of a true Credit Note facility; this has also been added.

Handling of VAT has undergone a thorough overhaul. The programs now make provision for three VAT rates, zero, standard and exempt. This is better, but I still think there should be provision for at least four rates, just in case the Chancellor decides we are getting too wealthy.

Almost every option in both programs has been overhauled and enhanced, many of the options now allowing selected display or printing of summaries. Search facilities in the Stock Control, Mailing List and Telephone Directory have been enhanced, no longer requiring you to have exactly the correct search pattern.

Even the Mini-calculator, which I could find no use for, has been given a new lease of life by the simple expedient of giving it a Print facility; you can now use it in much the same way that you would use a normal adding machine with a paper roll printout.

In my original review I said that I felt there was a market for such a suite of programs if it worked reliably. I am happy to say that most of my criticisms of Small Trader's Pack and Invoicer Pack have now been answered and I think the programs will probably suit a lot of small businesses because they are simple to use, providing most of the facilities and options you would need.

Trader's Pack costs £24.95 on disc; Invoicer Pack costs £14.95 on disc; or they can be bought together at £34.90. Available from SD Microsystems, PO Box 24, Hitchin, SG4 0AE. (Tel 0462 675106).

DR Graph printer drivers

Mr Soan of Cobham tells me that he contacted Digital Research about the lack of suitable 7 bit GSX drivers and was informed that they had not written any. It seems that the available 8 bit driver works with the KDS 8 bit printer port, but for some reason cannot handle four pie charts on one page. Mr Soan's solution is to print the page in two passes, half and half.

Serial 8056 printer

It appears from all the letters I have received that when Dixons were supplying the 8056 printer it came with a short program on tape which had to be run to set up the printer. Several people have sent in details of this program, and since one of them is an employee of Dixons, the program is listed in Figure I.

I am told that if this program is run before switching on the printer, and before any commands are sent to it, all will function correctly. The reason that the printer works with Mini Office II without this program is that the Figure I code is built into Mini Office.

```
1 RESTORE 4:SYMBOL AFTER 256:MEMORY HI
  MEM-47:m=HIMEM+1
2 FOR q=m TO m+45:READ a:POKE q,a:NEXT
3 hi=INT(m/256):lo=m-hi*256:POKE &BDF2
  ,lo:POKE &BDF3,hi:OUT &EF00,0
4 DATA &f3,&c5,&e5,&d5,&01,&00,&f5,&2f
  ,&57,&ed,&78,&cb,&77,&20,&fa,&01
5 DATA &01,&ef,&ed,&49,&1e,&0a,&7a,&21
  ,&73,&00,&f5,&2b,&7d,&b4,&20,&fb
6 DATA &f1,&ed,&79,&bf,&1f,&1d,&20,&ef
  ,&fb,&d1,&e1,&c1,&37,&c9
```

Figure I: Program to initialise the Serial 8056 printer correctly

One further enquiry I have received is from H.Farndon who finds that while the program sorts out the problem when using the 8056 printer under Amsdos, so far he has found no way that he can use the printer under CP/M. Has anyone found a solution to this problem? I suspect it would need a patch to CP/M to enable it to work.

Project Planner printouts

Project Planner is one of the early Amsoft programs that made use of the original Amstrad DMP1 printer, and hence will not work correctly with an Epson compatible printer. Mr Soan has come up with a fix for the problem, which is listed in

Figure II. At this rate, we will have solutions to all the offending programs before long.

The main Project Planner program should be LOADed, LISTed, and the lines shown in Figure II amended to suit. The program should then be SAVEd.

```
2538 IF ky$<>'y' AND ky$<>'Y'GOTO 2500
     ELSE PRINT#8,CHR$(0)

3000 PRINT#8,CHR$(27);CHR$(75);CHR$(6)
     ;CHR$(0);:bit=1

3390 IF · =0 THEN PRINT#8,CHR$(0);TAB(
     6):GOTO 3392

3397 IF bit=1 THEN PRINT#8,CHR$(0):bit
     =0 ELSE PRINT#8,k$;

10000 PRINT#8,CHR$(0):FOR n=1 TO 72-(3
     +2*c9):PRINT#8:NEXT
```

Figure II: Modifications required to Project Planner to enable printing with an Epson-compatible printer

Note that line 10000 may need to be REMmed out if the pitch does not suit normal paper.

Monitors

Sgt P.Cox from an Overseas BFPO number has a colour monitor for his 6128. He needs to get a mono monitor for it and wants to know what other makes of monitor he could use with the CPC. He appreciates that he will still need to use the colour monitor for the power supply, but as he does a lot of work in Mode 2, feels that a mono monitor would be more suitable.

To be honest, I wouldn't bother. With the right choice of colours, I find the colour monitor to be every bit as clear as the Amstrad mono monitor. My preferred choice for Mode 2 is:

```
BORDER 10:INK 0,13:INK 1,0
```

Qualitas Plus

One of the problems with the original Qualitas was that it only worked with those printers that were fully Epson compatible *and* offered quadruple density graphics mode. This ruled out its use with several popular printers, such as some of the Mannesman Tally and Shinwa range. This problem has been rectified and Seven Stars says that Qualitas Plus will now work with nearly all Epson compatible printers.

In addition, the program now works with a wider range of software, including, on the 6128 only, Masterfile III and Mini Office II.

Several versions, or loaders, are supplied; one to cover the 464 and 664, another for use with the 6128 or 464/664 with 64k of expanded memory. When the 6128 version is used, up to three fonts and the main program code are stored in the extra 64k, leaving more of the standard memory available for use by other programs. Two further loaders are provided for use with Tasword 6128 and Mini Office II respectively.

The manual is somewhat larger than before, running to 16 pages, and it now gives more detail on most aspects of the program. In particular it gives details of the precise procedures for loading and using Qualitas Plus with the most popular word processing and database programs, as well as from Basic and your own programs.

For those people who did not read the original review, Qualitas can be loaded at the same time as other programs and when you print anything, Qualitas will intercept the output and substitute its own fonts and tidy the appearance of the text before passing it to the printer. You can insert special codes into the text so that Qualitas will produce different effects. There is no need to save the text and print it separately, as with some programs.

Special fonts are also supplied for use with an 8 bit printer port, such as the KDS 8 bit printer interface, and these give even better results. I particularly like the Clarion proportional font which produces an excellent end result, fully right justified and microspaced if required. A variety of different effects can be achieved by the use of Double Height, Enlarged, Condensed and Underline. The only slight complaint is that Italics can only be achieved if the Piazza Italic font has been loaded, which is a more "spidery" typeface than Clarion. Special 7 and 8 bit font sets are provided for use with the Shinwa and Mannesman Tally printers.

The fonts supplied are the same as with the original version – Pica and Elite equivalents plus Mercury, a 10 pitch typewriter style font, as well as the already mentioned Clarion and Piazza. As before, a font editor is supplied so you can create your own fonts, or modify existing ones. Supplementary font sets are also available from Seven Stars Publishing at an extra cost.

The results achieved with Qualitas Plus are excellent; even the worst of dot matrix printers can be made to produce top quality output. While the speed of printing is somewhat reduced, any delay is well worth the wait.

Qualitas Plus costs £14.95 on disc, £12.95 on tape. It is available from Seven Stars Publishing, 34 Squirrel Rise, Marlow, SL7 3PN. (Tel 06284 3445).

Tasword to Protext

J.Brown from Coleraine in Northern Ireland has been using Tasword for a long time. Now he fancies changing over to Protext, particularly as this word processor would enable him to use the new Maxam 1.5 rom. He has two queries. Firstly, are text files from each compatible with the other and secondly, how big a file can he handle with Protext?

Tasword creates what are essentially plain Ascii text files, with the exception of any printer control codes, which are outside the Ascii range. These files may be loaded directly into Protext, but will not be instantly re-formattable. This is because Tasword uses normal hard carriage returns at the end of each line, whereas Protext uses a special soft carriage return. This is easily overcome by using Protext's Replace option to quickly replace the offending items. Replace can also be used to replace any Tasword printer control codes with their Protext equivalents.

Protext documents will not load into Tasword unless they are saved with the Protext PRINTF command (print file). The effect of this option is to create a plain Ascii file, which will load into most other word processors, including Tasword. Printer control codes will have to be replaced manually once the Ascii file has been loaded into Tasword.

With the rom version of Protext, depending on how many other roms are installed, you will be able to work with documents of between 37k and 40k. Later you may want to add the Promerge Plus rom, which effectively doubles this work size by giving you two documents that you can instantly switch between.

Home accounting

Mrs Owen has bought a 6128 and was hoping to use it to keep her accounts on. She is getting nowhere with the manual.

I think she is making the same mistake that a lot of people do initially, attempting to write her own program. I would recommend that she buys a commercially produced program written for the purpose. A number have been reviewed in *ACU* over the last year or two. Learning to program in Basic to a standard that would allow the writing of an accounting program isn't a five minute job by any means.

Dk'tronics 256k silicon disc

B.Soan has a 256k silicon disc for the 464 and finds that it does not work correctly with his 6128, corrupting the screen when it has been used for a time. It appears from the manual that it should work with either model – assuming it can be made to fit the slot. He wonders whether this could be an interaction with roms in his rom box.

I think this is extremely unlikely, although it has to be said that the dk'tronics silicon disc software is slightly flawed and can cause problems, particularly when saving and loading Ascii files.

I found that the 256k memory expansion unit for the 6128 would not work correctly on a 464, so I suspect there are some internal differences between the 464 and 6128 versions of the dk'tronics products.



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Screen shots from Atari ST version

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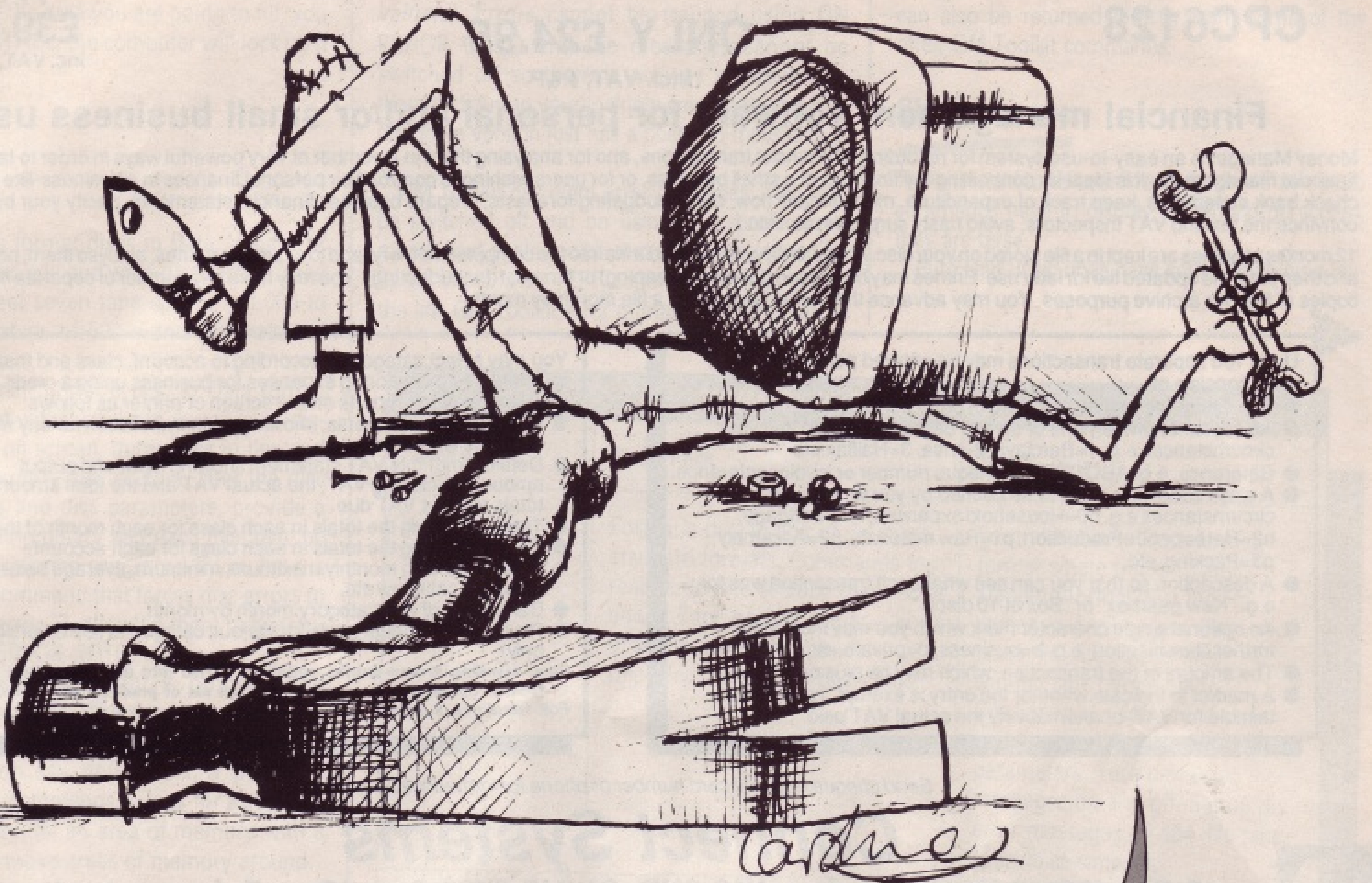
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Help!

Alastair Scott finds two silver hammers that feel fine and put an end to the long and winding code

ALL toolkits all have one thing in common – RSXs. At first the dreaded RSX bar symbol gave people who called themselves programmers an excuse to write trivial routines, market them as world shattering improvements to Locomotive Basic and pocket the proceeds. Things, however, have improved greatly.

Two more disc-only toolkit programs have recently been released. They are GM Toolkit by G.Middleton, and Flash Basic – otherwise known as Bonzo's Flash Pack – by Nemesis.

The Flash Basic code occupies 8k and can be relocated to any address between &4000 and &8000. On loading it will be installed automatically just below HIMEM unless you relocate it elsewhere. If you are short of memory there is a cut down version that takes up 3k and has 22 of the 68 RSXs omitted. Yet another version must be used if you want to write stand-alone programs. The Flash Basic code doesn't interfere with expansion roms.

The GM Toolkit code, with 50 RSXs, can only be located at &8000. It occupies 10k and, if you own any, overwrites your expansion roms' workspace, zapping their RSX commands. You must switch off these roms before running GM Toolkit, otherwise the normal disc rom commands such as |ERA and |REN will not be recognised.

Flash Basic has very few graphics commands. There is one to provide double height characters, plus two more to draw boxes and lines. |BORDER and |INK allow you to change screen colours using the cursor keys.

There are some excellent scroll routines that allow you to scroll the screen in any direction with or without wraparound. Also useful are two commands that store compacted copies of the screen in memory, and re-display them. These compacted screens can be stored on disc saving, on average, 7k per file.

Graphics manipulation is certainly GM Toolkit's strong point. You can split the screen into two different modes, switch between two screens in memory and draw circles and ellipses. But the most original are the sprite and fill commands.

Sprites are set up using two commands that dump a section of the screen to memory and copy it back to a different area. You can use Force, AND, OR, XOR or Transparent mode to combine the sprite with the pixels already there; sprites can also be reflected about an axis.

These commands are extremely fast and allow some slick animation. A program is supplied that allows you to design sprites on a grid and store them on disc. It is very basic, with no fancy options such as rotation or reflection, but it works.

There is a command in GM Toolkit that fills any area, and another that fills a simple shape such as a rectangle or circle incredibly quickly – about eight times faster than the Basic 1.1 equivalent. You can use four extra pens – pens 0 to 15 are as normal, but pens 16 to 19 are multi-coloured patterns created with the pattern designer. If you

design a pattern that has adjacent pixels the same colour as the area you are going to fill, you must use ¦FASTFILL; the computer will lock up if you use ¦FILL.

Revolution

Flash Basic can format discs to Data, Vendor or IBM format, read, edit and write disc sectors, read tape headers, set seven tape speeds – 1,000 to 4,000 baud in steps of 500 – and list protected Basic programs.

GM Toolkit can format a disc to Data format only, format individual tracks to any format, display Ascii files on screen, dump files in hex and Ascii, read and write disc sectors, alter the disc error messages and disc parameters, provide a method of reading binary and Ascii files byte by byte, and list protected programs. If you have a 464, there is a command that forces disc errors to produce Basic error 27, allowing them to be trapped using ON ERROR GOTO.

Flash Basic's strong point is program and memory manipulation. There are commands to list all variables and arrays in a Basic program, list the function key definitions, a powerful memory editor, commands to look for a series of bytes in memory, fill an area of memory with a given byte and move areas of memory around.

The ¦INFO command displays the values of HIMEM, program size, variable size and free memory, and there are three ¦FIND commands, which display the line numbers of all occurrences of given keywords, strings or variables in a Basic program. But there is no ¦REPLACE command.

GM Toolkit has one command to move areas of memory and another that copies the contents of any expansion rom into ram. That's all.

Paperback writer

Flash Basic is rich in printer utilities. To start with it has the ¦P.ON command, which echoes screen output to the printer. This is disabled, rather aptly I thought, by ¦P.OFF.

Other commands allow you to switch double line feeds on or off without fiddling with DIP switches, disable and re-enable the PRINT#8 command, send all printer output to a file previously opened with OPENOUT and send a string of Ascii codes to the printer.

There are three screen dumps – one command gives a fast character dump, another produces a character dump each time the Tab key is pressed, and ¦POSTER is weird. It provides a 27 shade graphics dump in any mode using an Ascii character to represent the colour of each pixel. The results are spectacular, but you need eight A4 pages per dump. You can alter the characters used for the dump with two further commands.

GM Toolkit uses ¦PTRON and ¦PTROFF to echo screen output to the printer, and ¦GDUMP, which produces an A4 single or double density graphics dump in any Mode. It is not a true shaded dump as it assumes that INK 0 is darkest and INK 15 lightest – or vice versa – but it works well except with single density when, due to a bug, the top nine screen lines are not printed.

Flash Basic has two error messages: *Wrong number of parameters* and *Invalid parameter value(s)*. Errors cannot be trapped using ON ERROR GOTO and the messages cannot be switched off so there is no way of preventing them disfiguring your lovingly-created screen. The cut down version just has a beep, no messages at all.

GM Toolkit has eight error messages. They can be switched off and on using two special commands, but again toolkit errors are not trapped by Basic. There is an ¦ERR command, which returns the last GM Toolkit error number, allowing you to write your own error handler. This error number can also be returned directly from some of the other GM Toolkit commands.

She loves you

Toolkits need to be user friendly; when Flash Basic commands have to display something on screen, they are terse.

But Flash Basic does have some redeeming fea- ➤

SUMMARY OF THE TWO PACKS

Facility	Flash Pack	GM Toolkit
Disc and tape handling	Format a disc to any of the three standard formats. Commands to read and write sectors. Disc sector editor. Tape header reader. Choice of seven tape save speeds. Deprotects protected Basic files.	Format a disc to Data format; format single tracks to any standard format. List files to screen in Ascii or hex. Deprotect protected files. Read files sequentially byte by byte. Commands to seek, read and write sectors. Set up disc drive parameters. Turn disc error messages on and off. Set up dis error messages on 464. No tape-specific commands.
Printer control	Screen echo to printer. Re-direct printed output to file. Prevent characters being sent to printer. Send lists of Ascii codes to the printer. Fast Ascii character screen dump. Poster sized 27 shade graphics dump. Set up the Tab key to give character dumps at the press of a key. Suppress or allow double line feeds.	Screen echo to printer. Grey scale graphics dump in any mode, single or double density.
Memory manipulation	Fill, move, test, load, save, edit, list and search in hex or hex plus Ascii	Move ram or rom
Basic programming utilities	Find strings, variables, arrays and keywords. Display info about Basic program in memory.	None
Graphics commands	Double height characters. Graphics paper and graphics pen commands. Boxes and lines. Change colours with cursor keys. Scroll screen left and right with or without wraparound. Scroll screen up and down. Screen compacter and uncompacter.	Sprite commands, fill commands, split screen modes, draw on and switch with a background screen. Graphics pen, graphics paper and circle commands.
Miscellaneous	Which CPC, copychr, pos, flush input buffer, hex to decimal conversion, double peek and poke, pause, single string array sort, automatic menu and input commands, call the firmware from Basic.	Which CPC, double peek and poke, trap toolkit error messages, call the firmware from Basic
Extras	Disc is packed with useful programs written with Flash Basic. Another disc of Flash Basic programs available at £12.50.	Sprite designer, pattern designer and two good demonstration programs.

tures – on loading, the function keys are set up to provide useful commands, and you can prevent the output from some commands scrolling too quickly off the screen by pressing the Z key, which freezes everything until you press the A key.

Many of the GM Toolkit commands have two forms; the first form prompts for a filename, whereas the second, with parameters, is meant to be used from within a program. The first form gets around the awkward way Basic 1.0 passes strings to an RSX. The major problem with GM Toolkit is that many of the command names are unnecessarily long.

Both sides of the Flash Basic disc are jammed with demonstration programs. You get disc menus, screen compressers, tape to disc transfer utilities, Ascii file manipulators, Help files and the modestly titled Disc Editor. This superb program uses the Flash Basic commands to provide a powerful hacking tool. It can fast format discs, give header information, make disc maps, search a disc for any string or empty sectors, edit sectors, and a whole lot more. Although this disc editor cannot deal with non-standard formats, it is on a par with many commercial disc utilities.

There is another disc from Nemesis, Bonzo's Big Jobs, which has more Flash Basic programs, including a very good database and a sprite designer. GM Toolkit has sprite and pattern designers plus a demonstration program that shows off the other graphics commands.

This program is amazing. Firstly, it draws various windows, fills them with patterns, moves them round the screen quickly and fairly smoothly, shows off the circle drawing command, and then loads another program, which uses the sprite commands plus screen switching to display a large ball bouncing around the screen, spinning as it goes.

Flash Basic has a lot of commands that defy categorisation. Some are trivial, whereas others are very useful. For example, |COLOUR and |GREEN set appropriate colours for your monitor, |SORT sorts a string array into descending order, |MENU gives you easy menu selection and |INPUT is a crash proof input routine.

GM Toolkit has very little else in the way of extras. There are 16 bit |PEEK and |POKEs, graphics pen and paper commands for 464 users, and a command that tells you which CPC you are using.

The end

Both toolkits come with clear and informative 24-page photocopied manuals, and both toolkits have an adequate command to list all the RSX commands set up. Although these programs are both billed as toolkits, they are vastly different. Flash Basic is designed to provide all those awkward machine code routines you need when writing utility programs, GM Toolkit is mainly concerned with graphics manipulation.

Both have their strengths and weaknesses. Flash Basic's strength is its huge variety of commands, the excellent toolkit routines and the programs and documentation accompanying it. Flash Basic's weakness is its lack of user-friendliness.

If you are a programmer, particularly in machine code, you won't get much help from GM Toolkit – your expansion roms will be blitzed and you will lose 10k of memory. GM Toolkit would be better if it concentrated on its strengths and contained more graphics commands at the expense of disc utilities.

Bonzo's Flash Pack for all CPCs costs £12.50 on disc only. It is available from Nemesis, 10 Carlow Road, Ringstead, Kettering, Northants, NN14 4DW. (Tel 0933 623967).

GM Toolkit for all CPCs costs £14.95 on disc only. It is available from G.Middleton, 18 Newlands Park Road, Scarborough, North Yorkshire, YO12 6PX. (Tel 0723 351024).

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ML11

ARCTICFOX

THE aliens are at it again. They have established a base at the extremely inhospitable South Pole. Your mission, should you wish to accept it, is to thwart the invasion by destroying the aliens' main fort.

To this end you are equipped with the latest Arcticfox one-man tank – a 37 ton killing machine with a top speed of 144 kph. Armed to the teeth with a 150mm cannon, twin mine dispensers and line-of-sight guided missiles, it is a battle to the death – probably yours – in the icy Arctic wastes.

The view from within your cockpit consists of a 3D vector representation of the snowy landscape, your radar, your compass and the weapons systems.

The view outside is on the small side but adequate, and good use is made of colour as you cross the occasional grassy bank or climb a small hill for reconnaissance. Mud flats and deep crevices add to the ground detail and ways to die.

The occasional snowstorm makes things even more difficult because the screen turns totally white; in a really bad electrical storm the radar conks out.

The enemy forces consist of missile launchers, tanks, floating mines, fighter planes and scouting craft; all will take great delight in terminating your mission. As the aliens do not like air very much, they have erected huge towers that convert oxygen into the poisonous much they breathe.



Destroying these huge structures benefits humanity, increases your score and probably saves the ozone layer into the bargain.

Various communications forts are dotted around the large playing area. Destroying these reduces the enemy's chances of alerting their fighter planes. Radar posts will inform on your position. Sometimes they will jam your radar, giving you a false sense of security.

Although you start in one of many positions, you soon come to know the lay of the land, learning to avoid certain hilltops that the enemy have placed mines and missile launchers on or behind.

The best way to destroy these sneaky hidden aliens is to fire a guided missile. The display changes to that from the missile itself and you can steer it over the hill, straight into anything hiding on the other side.

The missile is also a good way to make a quick scout of the area – you can fly quite a distance before losing contact with the Arcticfox.

Mines can also be dropped. These are useful as practice targets for your missiles.

Your radar display is essential, although getting the hang of the way it works in conjunction with the compass takes a bit of getting used to. You can toggle the radar display to give an aft view from the tank.

The aliens' main fort is usually situated towards the middle of the playing area, and as you get closer the tanks and planes start to home in on you in earnest.

If you are crossing a snowfield you can hide yourself by digging in, but more often than not when you re-surface you find a battalion of tanks waiting for you.

Destroying the fort requires 10 pinpoint accurate shell hits or two strikes with your limited supply of guided missiles.

Author: Dynamix for Electronic Arts
Price: £8.95 tape, £14.95 disc

Liz

TACTICS play a large role in this game, making it a long lasting and very enjoyable challenge, with complete freedom of movement within the playing area.

Those of you with masochistic tendencies will be delighted to hear that you can even crash a missile into your own tank. This is usually fatal.

There are two versions of the game on the disc, one for the 464/664 – which is also the tape version – and one for the 6128. The disc-only 6128 version contains an extra beginner's level plus an excellent enemy preview display.

17/20

Nigel

THE action is reasonably fast; it can get quite hectic when approaching enemy bases. The display on a green screen monitor is OK, but determining whether the warning light is yellow, green or red instead of green, green or green takes some doing.

Sound effects are limited to the occasional explosion plus the dreaded whooping siren that indicates the enemy knows your location and is going to do something about it.

15/20

Colin

ARCTICFOX is a great game. When you are approaching the main enemy fort and are just about to launch a guided missile and a blinding blizzard blows up from nowhere, the excitement is tremendous.

With many levels of play and many enemy configurations to choose from, this thinking person's BattleZone should keep you busy for a long time.

18/20



PROFESSIONAL BMX SIMULATOR

THERE seems to be a growing conviction these days that if you can do it in real life, you can do it on a computer. This philosophy can result in some surprisingly entertaining games, the lawnmower simulator featured recently in this magazine being one unlikely example.

Professional BMX Simulator comes on two cassettes. The first contains the standard and expert versions of the game on dirt biking courses. The second provides extra courses covering both quarry racing and desert riding.

With Professional BMX Simulator, Code Masters is claiming a first on the CPC in providing simultaneous action for up to four players. This is achieved by using three keyboard combinations and the joystick to control the riders.

The controls are simple – pedal, steer left, steer right. This is only to be expected; a BMX bike is after all a simpler piece of machinery than even the famous *ACU* lawnmower.

During each race the course is viewed from above. The graphics are detailed and make full use of colour. However, it must be said that



on a green screen monitor it is not easy to determine who is racing who.

In the expert version each player is asked to select their preferred tyre width and chainwheel size before the start of the game. Narrow tyres are not as effective in turning but give increased speed because of the reduction in drag. Small chainwheels allow snappy acceleration but give a lower top speed.

This is a difficult game to master and there is no doubt that, with two cassettes plus a poster and stickers, you get plenty for your money.

However, a good simulation should allow you to feel that you are actually carrying out the activity in real life. For all its attention to detail, Professional BMX Simulator fails to do this.

The bird's eye view is possibly at fault here. The coloured blobs that you manoeuvre around the course could represent anything from jet propelled skateboards to nuns on pogo sticks.

Author: The Darling brothers for Code Masters
Price: £4.99 tape

Liz

Not the best simulation I've seen but a frustratingly difficult game to get to grips with. You'd probably need to be a BMX fan to get long term enjoyment from it.

Very attractive graphics, although perhaps a bit cluttered in some cases. The four player option is the one thing that sets it apart from other games for the CPC.

14/20

SUPER HERO

IS it a dwarf? Is it a Viking? No, it's a superhero. For argument's sake we shall call our superhero Brian, as this is possibly the least superheroic name possible.

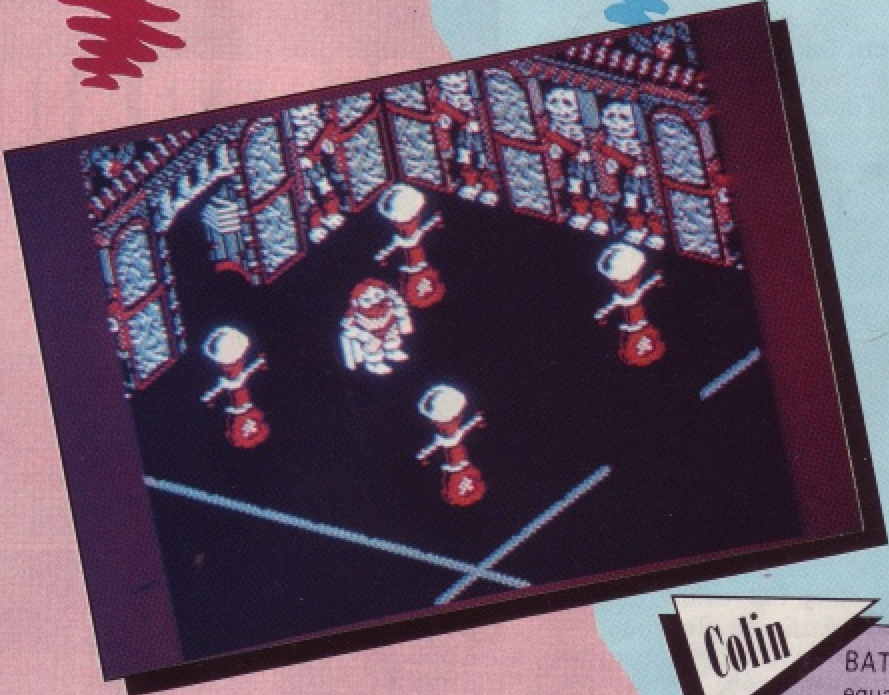
Brian must feel rather left out when invited to superhero parties; he probably spends most of his time in the kitchen. You see, he's rather small, has long hair and a rather bushy line in beards.

As with all superheroes – and super heroines, I may add – Brian will undertake any task, free of charge. This is quite difficult for Brian because he can't fly, carry things, do magic or kill nasties. All in all, he's just not cut out for the job.

So Brian is dumped in a bizarre set of rooms – decor by Bernie Drummond of Batman fame – and he can't get out until he has collected a certain number of Guardian Spirits.

Far from being free booze for journos, these things are in fact the root cause of all the nastiness in the area.

First priority is collecting the jumping boots, without which Brian has all the aerial capabilities of an elephant. Other grabbable goodies



include a war hammer for wasting things, a bag for grabbing things and a helmet for magicking things.

The game is large, with more than 600 rooms claimed, all of which scroll neatly into place. The pace is as fast as an isometric game allows, which varies between lightning fast on empty screens to dead slow on complex ones. The playing screen is very small, so small that Brian can disappear off at the corners.

Paul Machacek, the author, now writes for the arcades and usually the cost of developing such a big game as this goes into the retail price. Code Masters has put this out at the usual budget price.

Maybe Brian would not be so happy if he was told that he is appearing at less than two quid. Let's not tell him, OK?

Author: Paul Machacek for Code Masters
Price: £1.99 tape

Colin

BATMAN minus £8 equals Superhero, it's as simple as that. As with all isometric games, it is dead easy to get killed off in Super Hero by getting the alignment out by one pixel.

The backgrounds are nice, and the whole system is like Filmation 2 should have been. Noises are made which could be tunes, and your character goes "Deedle Deedle" when he walks. Too kitsch for words.

16/20

PHM PEGASUS

PHM Pegasus puts you at the helm of a state of the art American hydrofoil, your aim to complete one of eight missions. Five of these missions take place off Cuba, two in the Mediterranean and one in the Gulf.

They have topical aims such as escorting tankers through troubled waters and foiling terrorists.

You can switch between a view through the front window of the hydrofoil, which shows anything in the vicinity, and a map showing where you are.

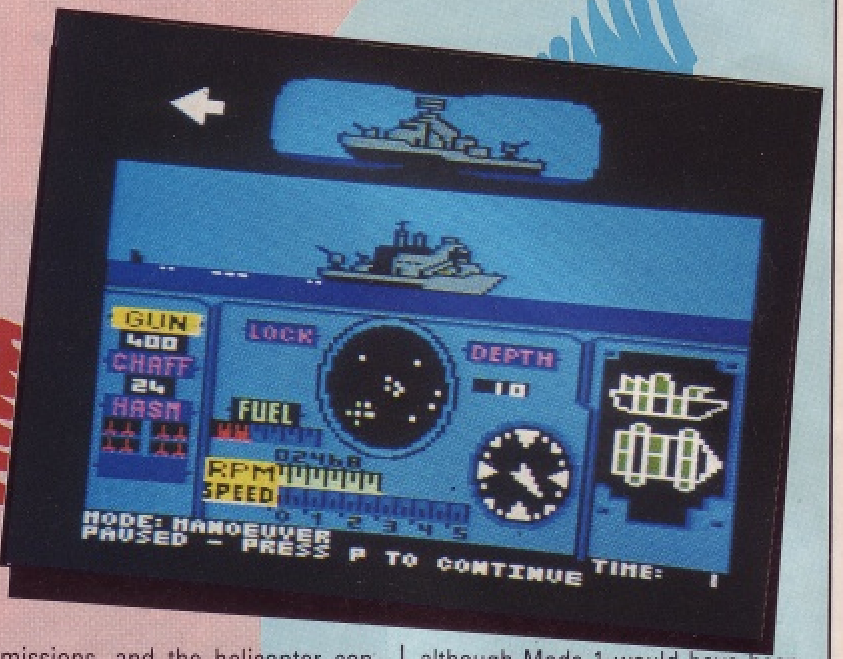
You have a radar scanner effective over 2.5 to 40 miles, binoculars which allow you to aim at targets, and five methods of firing at them – 76mm cannons, chaff rockets plus Harpoon, Exocet and Gabriel missiles.

This is really a watery flight simulator, with less emphasis on watching the controls and more on strategy. You need to keep a close eye on the map and the radar screen, and must make sure you are taking pot shots at the enemy, not at your friends.

Identification of craft is greatly aided by a set of cards that can be cut out of the instruction booklet; they tell you all you need to know about the various helicopters and ships.

The control keys – all 28 of them, nine of which can be replaced by a joystick – are also on a card for easy reference.

You can also launch two helicopters to spy on the enemy in certain missions, and the helicopter controls can be used to guide supply ships and convoys.



One unique feature is that you can speed up, or slow down, time. If the game is progressing slowly and getting boring, you can press a key to speed up time by a factor of between 2 and 128. Another key reduces it by the same factors. This is an excellent idea.

The sea looks suitably choppy, although Mode 1 would have been preferable to blocky Mode 0, particularly on the map screens, which have some very wonky cartography.

The sound is nothing special – just a persistent buzzing noise that can't be turned off, and the occasional bang when you are shot at. No problems in green.

Author: Lynsoft UK for Electronic Arts
Price: £8.95 tape, £14.95 disc

Colin

ALTHOUGH there are about 30 control keys they are laid out very carefully, so it is unlikely that you will fire a missile by mistake.

A good program with varied scenarios, although a little more care could have been taken with the graphics. Why do the Commodore 64 screen shots on the inlay card look so good?

15/20



£1.50 each

1988 – March: Dan Dare II – full map. Family tree software review. Scruples from Virgin. Educational software the truth home to roost. Microstuffer – printer buffer. Mastering INSTR.
April: Cage rom the ultimate viewdata tool, Basic Tutor on interrupts, Flying Shark, PAW adventure creator, Hewson's Anarchy, Part one of Pat Winstanley's writing adventures, Isobot listing.
May: Part one of Jill Lawson's art lesson, Adventure writing adding a plot, ATF full review, Brainstorm pokes, Basic Tutor On Gosub, Polar listing.
June: Part one of Auntie John's machine code, Basic Tutor on boolean logic, Adventure writing final part, Micro Music Creator, CP/M+ on rom, Rodos xtra, Nebulus full review, Cybernoid, Gothic, L.A. Swat, Revenge of Doh, Driller solution, Creeper lizting, AI nought and crosses, Amstrad espionage.
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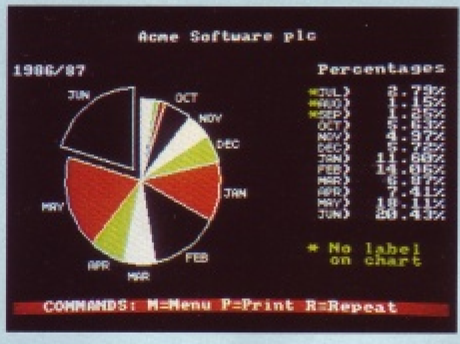
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AMGRAPH*

Amgraph allows you to enter tables of figures and present them in a neat, graphical form. In addition to pie and bar graphs, this program offers stacked and 3D bar graphs, all with automatic scaling and an Epson compatible printout facility. *November 1985.*

SORCERY PLUS HACK*

A suite of programs that makes playing Sorcery Plus easier and more fun. You can easily adapt the sprites to your own design, and increase your survival chances. *January 1986.*

HOMESPREAD

A simple but flexible spreadsheet program you can use without having to learn all the complicated commands of a big spreadsheet, yet still perform some startling and sophisticated operations.

DIARY

A disc-only program that demonstrates how to simulate random access files under Amsdos without resorting to machine code. Diary is a useful program for making sure you don't book a table at the local sushi bar when you'll miss EastEnders.

MODE 3*

Mode 3 is a two-screen, four colour, Mode 0 that lets you have data on the background screen which you can't see, but which is nevertheless there. Very fast animation can be created by flipping instantly from the foreground to the background screen. *January 1986.*

ANIMATOR*

Animator is a wire frame drawing suite of programs that allows you to put together a number of key frames, and the software will 'tween' them to produce a finished cartoon. *April 1986.*

TRACE*

The TRON and TROFF commands are very useful for debugging basic programs, but they often make a mess of the screen. This routine allows you to re-direct the trace to a screen window or printer. *December 1985.*

CHORD FINDER*

This program can display over 2,000 chords, and up to 36 chord shapes can be saved to tape or disc and loaded when required. *September 1985.*

JET SET WILLY HACK*

Infinite lives and a magic teleport help you trip around miner Willy's mansion. Note that this hack will only work with The Final Frontier version and not with the versions of the game that appeared on a compilation. *September 1985.*

DOUBLE HEIGHT PRINT*

A useful routine for enlarging letters on the screen. So if you are a tall type, then letters help you to expand your horizons. *September 1985.*

ELITE DISC HACK

So you have been playing Elite for a while and are still mostly harmless. If you want millions of credits, a few bolt-on goodies or even the hallowed Elite status, then ZZKJ's program can provide it. Instantly.

JUSTIN'S SCROLL*

If you look in wonder at arcade games in which spaceships whizz over a planet's surface at one million miles per hour and wish that you could write a program to do that, then you need Justin's Scroll. Peter Green adapted this program for the scrolling in Rimrunner, and the Zeit Corporation found it came in useful for BMX Kidz. This *is* how the professionals do it. *June 1987.*

RSX LISTER

Most utility roms contain an RSX lister, but they only list those RSXs that are in rom. What about those that have been soft loaded? With this routine you can reveal *all* the RSXs hidden in your ram.

In some cases you will need to refer to the issue of ACU in which the programs appeared. In the list above these are shown by * followed by the month. If you do not have these issues, you can send for the Utilities Unlimited documentation pack at the special price of £4.95.

PRINTER SPOOLER

When you print out a file from disc Arnold spends all his time printing. With a posh computer, like the PC, this kind of job can be done in the background enabling you to carry on using the computer while the printer is working. With Printer Spooler your humble CPC can do the very same thing. It's just like having two computers.

EPSON DUMP

A dump for Epson compatible printers, ideal for taking hard copies of Mode 1 or Mode 2 screens, or parts thereof. Works with the DMP2000, DMP2160, or any other similar printer, but not with the DMP1.

THE NOBLE ORGAN

Turn your computer into a different kind of keyboard – a musical one. OK the CPC is no Fairlight, but the AY-8-912 can sound pretty impressive if you have light enough fingers.

ZX LOADER*

A routine, that will allow you to read in Spectrum binary files. This will *Not* let you play Spectrum games on your CPC, but it is ideal for transferring data and graphics between two otherwise incompatible computers. *July 1986.*

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ATV SIMULATOR

THE first track is kinda sandy, and is guaranteed to cause a tumble until you have had a few goes. You can wheelie the ATV and do a small bunny-hop to clear low objects.

Despite this flexibility, it is guaranteed that you will go too fast, too slow, or perhaps just be wearing the wrong style of shirt. Falling off is like breathing – something we all do, but have enormous difficulty trying to stop.

In the euphoria of it all the front wheels will dip, and you can guess the rest.

There are six tracks in all, with a time limit from 40 to 60 seconds on each. They all scroll from right to left and have a tidy, if rather dull, line in background graphics.

Some levels have moving beasties that will do their darndest to knock you off. Animal lovers will soon become animal loathers as yet again the birds in the fifth level topple you from your mount.

The really clever bit is the two-player game, where the screen is split in half and players compete against the clock. Needless to say, this is a little slower than the single player game.

An option exists to switch off the background graphics to give more speed to the game. Having done this, the dual-play mode seems far faster than the original one-player game.

It is even possible to define both players as the same keys, and have races with yourself. Start worrying if one of yourselves wins before track five – it shouldn't be possible.

Nobody is going to lose any sleep over the lack of a loading screen, and the game loads speedily because of this. Its Spectrum origins are clear, although nowhere could this be said to be a disadvantage.

The characters are well animated and move quickly. The nasty birds are a bit blurred but definition doesn't really matter when you are a nasty – it's the presence that counts.

Author: Tim Miller for Code Masters
Price: £1.99 tape



Colin

A GOOD few hundred pounds less than the real thing, and much safer to boot. I mean, if you booted an ATV, you'd break your tootsies.

A Whittaker tune and clean graphics make this game fun to be with, and the gameplay keeps you on your toes. I've always wanted to do a wheelie on a crocodile, and this has given me my chance. It's fast and furious, pop pickers, and lots more fun to play than to write about.

18/20

GUNSHIP

GUNSHIP puts you at the controls of a $8m Apache helicopter. You have various missions to complete, ranging from a simple training flight in the US to Communist bashing in Vietnam and a full scale war against the Warsaw Pact countries.

To start off you enter your name, choose your mission, then the level of danger and the degree of realism required.

You then arm the helicopter, choosing the weapons you want up to a maximum weight of 21,000 lbs, making sure the helicopter is balanced.

The scene switches to the cockpit. You have to take off and fly around, seeking out the enemy forces, watching out for difficult terrain and mountain ranges. The view out of the cockpit window is wire frame 3D, and you can switch to an overhead map at any time.

The display panel is packed with information – everything from the usual altimeter, airspeed indicator, artificial horizon and so on, to exotica such as damage warning lights, threat display, radar jammers, stores selection and torque gauges.

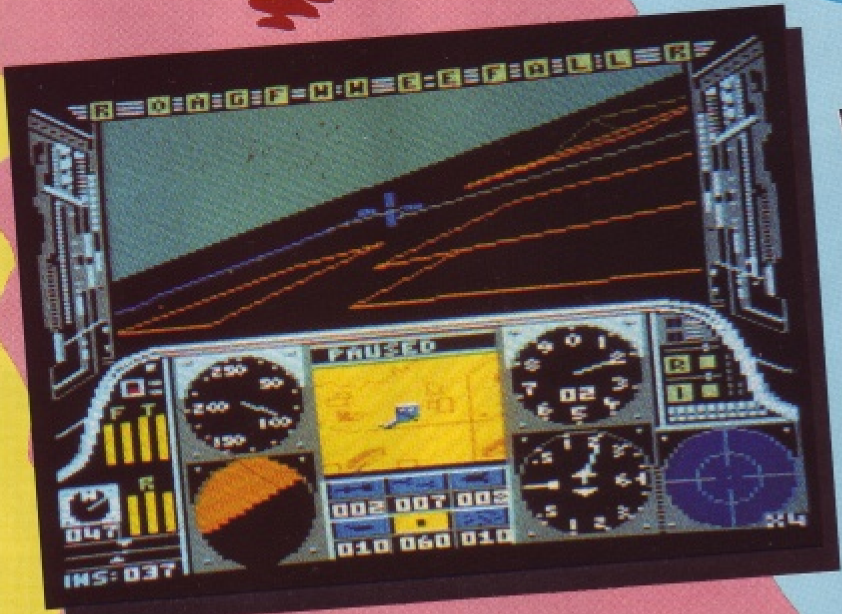
The game, as you would expect, is hard. Helicopters are difficult to fly because they respond very sluggishly to the controls, of which there are two sets to deal with – the cyclic, which rotate the helicopter, and the collective, which move it up or down. Even moving forward is a tricky operation.

There are also two engines, which can be independently controlled, and a tail rotor, which swings the nose. In fact, there are so many control keys that a keyboard overlay has been provided.

The graphics are reasonable; the cockpit screen is rather blocky and the wire frame graphics are difficult to interpret, but the map and everything else is perfectly clear.

The sound is deafening. The swish of the rotor blades quickly becomes annoying, and there is very little else other than the odd explosion.

There are three hardware restrictions – you must have a joystick; according to the manual the program will not work on the 664 and green screen users will have problems, as various indicators on the control panel and the map flash different colours depending on whether something is OK or faulty.



Liz

IT's Microprose's usual meticulous stuff. The attention to detail is incredible – the manual even has chapters on military equipment on the modern battlefield and helicopter aerodynamics. It reads more like a textbook than instructions for a game.

The only slight letdown is the indifferent graphics on the cockpit screen, but the excellent animated map and the pointer control more than make up for this.

16/20

Author: MicroProse
Price: £14.95 tape, £19.95 disc

DREAM WARRIOR

IT is not every day you get to save the world in a computer game – just every five minutes or so. Here we are quite firmly in the future; corporations controlled by the evil FOCUS Fellowships rule the Earth. These bright sparks can focus demons from the DARK SIDE into dissidents' minds.

No evil alliance is perfect; the infighting between the FOCUS groups has allowed your scientific team – ASMEN – to attempt to break the deadlock.

The attempt was partially successful in that it held off the unpleasant DREAM DEMON (yet more capitals), but three of the ASMEN were caught. Since their minds are slowly being pulped by the nastiest demon of the lot, you are quite keen on getting them back.

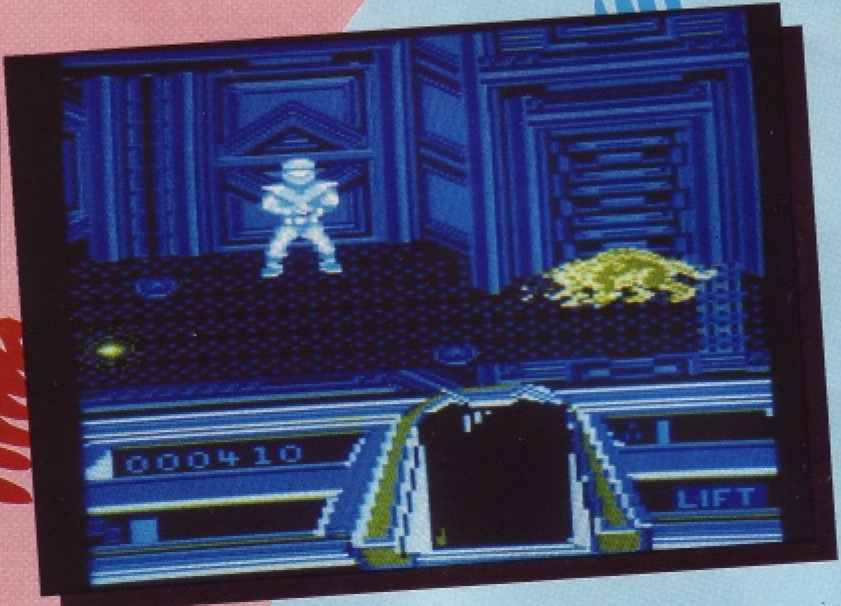
To enter the domain of the demons you must be asleep. You have to fend off the demi-demons, who carry pods which can be useful. Blue demi-demons carry parts of the trapped ASMEN's psyches; green ones keep your transport system happy; red ones give access cards to sleeping draughts; grey ones give lift passes.

Demi-demons zoom about in front of some rather pleasant background graphics. But all is not sweetness and light in the scrolling corridors, for there are floor mounted locks that operate barriers. These must be triggered in the right order.

Lifts allow access to the different floors, but are hard to spot as they look much like the rest of the scenery. Equally high in the difficult-to-see stakes are the sleeping draught lockers. Blue walls, blue character, blue floors and a few blue nasties keep the first level graphics feeling... blue.

The final conflict takes place in a black hole, where Ocular, the Big Chief Demon, is having fun with your pals. As his name implies, Ocular is well endowed in the visual department, and these eyes must be shot to close them. Once the eyes are closed you and your pals are free to stop the world going insane.

Author: Tarran Ltd for US Gold
Price: £9.99 tape, £14.99 disc



Liz

THE inlay card says "combining strategy and depth of gameplay..."; this may require translation from hype-ese. The strategy element is determining the best way of rationalising the waste of your money on the game. The "depth of gameplay" is a carrot on a string to keep you playing.

Contrary to what US Gold may say, graphics do not make a game. I doubt this one would rate much at two quid, so the asking price is a little over the odds. Any game whose object is to remain asleep is flawed somewhere. Me, I'd rather be delirious than have dreams like this game.

7/20

VECTOR BALL

THIS is described as a cross between ice hockey, netball and Crown Green bowling. It is really a peculiar version of football, with one droid, rather than 11 humans, on each side. Two people can play against each other, or you can play the computer.

The game is played on a scrolling pitch which is three screens wide. The pitch is not flat, but has assorted lumps and bumps variously described as hills, ditches and waves. You can choose any of these contours, or a mixture of all three.

There is a goal at each end; all you have to do to score is to force the ball through the opposition goal using your droid, which can hit the ball or barge the opponent.

You have three, five or seven minutes in which to play the game, and there is a system of handicapping which puts more bumps on the higher levels, making it more difficult to control the ball.

The game, unfortunately, is almost unplayable. The direction in which the droid is moving is controlled with the joystick or redefinable keys; the direction in which it can shoot is controlled with Fire held down, as well as the joystick or keys.

As the game is extremely fast, this means that it is very easy to get flustered, press or release Fire by mistake and hit the ball in entirely the wrong direction. Own goals are depressingly common.

The entire playing surface is boring white on black; there is almost no colour, and the scrolling is so fast and flickery that it can be painful to watch.

The programmers have attempted to put the blame for this mess on the screen memory layout, which is really a case of bad workmen blaming their tools. According to the inlay card, you should be able to alter the mass of the ball and the droids, timeout, acceleration, breaking and friction. Not on this version.

Very little information is given about keys and options. Vector Ball is a clever and original concept completely ruined by bad programming.

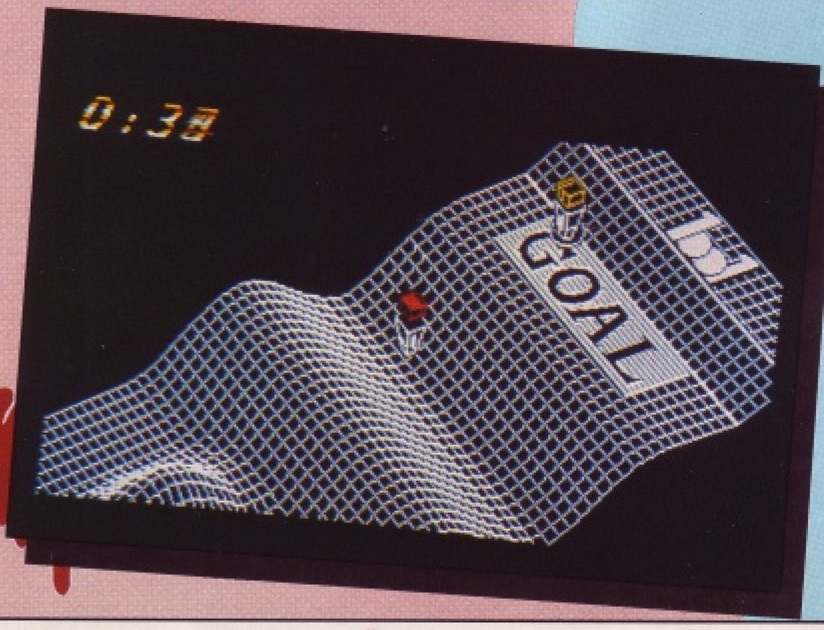
Author: Binary Design for MAD
Price: £2.99 tape

Nigel

THE graphics bear a slight resemblance to those in Highway Encounter, but all similarity stops there. The worst part of Vector Ball is the instructions, which are complete nonsense.

It took me about four games before I realised I could play the computer, which is very good at gaining a four or five goal lead and then preventing you getting the ball.

5/20



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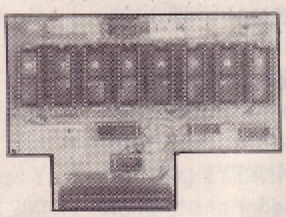
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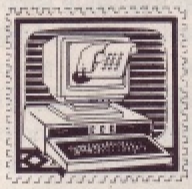
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Freedom of the press

Jeff Walker discusses alternative ways of talking to your computer

THE Locomotive Basic INPUT command can be a right pain at times. I mean, there you are writing a program that insists the user types in no more than three numbers, and no matter how many notices you put up like Enter Three Numbers and No Letters Allowed, the Locomotive Basic INPUT command quite happily lets Joe Gormless type in 255 characters of his choice.

Two seconds later Arnold has his say with *?Redo from start* and Our Joe goes through his 255 characters looking for the letter sequence "start" so he can begin again from there. Like I said, the Locomotive Basic INPUT command can be a right pain at times, which is why this month we are going to look at how to get by without it.

Let's start with detecting single keypresses. To do this most programmers go straight for INKEY$. This is because it is the way it has always been done. But Arnold has INKEY as well, which provides a more elegant and more versatile way of testing for keypresses. The difference between the two is very simple.

```
10 in$=INKEY$
```

The INKEY$ function returns a string – the Ascii character of the key pressed. It returns this string in a user-defined variable, so that *in$=INKEY$* will return the Ascii character of the key that has been pressed in the variable *in$*. If no key is pressed then INKEY$ returns a null string. A null string is represented in Basic as two quotation marks with nothing in between.

```
10 in=INKEY(71)
```

The INKEY function returns an integer that represents the up or down state of the key whose key number is held in the brackets immediately following the keyword. 664 and 6128 owners have these numbers stamped on their built-in disc drive, 464 owners see Appendix III Page 16 of their manuals.

The value of the integer returned by INKEY can also tell us whether the key has been pressed at the same time as the Shift or Control key, or both, so that *in=INKEY(71)* will return – in the variable *in* – the number zero if the Z key is pressed on its own, 32 if the Z key is pressed at the same time as Shift, 128 if the Z key is pressed at the same time as Control, and 160 if the Z key is pressed at the same time as both Shift and Control. If the Z key is not pressed, INKEY will return a value of –1 (see Figure I).

Arnold scans his keyboard 50 times every second, and both functions jump on and off this moving merry-go-round very quickly. The difference in speed between the two is negligible, but INKEY$ is ever so slightly better at doing it than INKEY. I'm going to impress you now – at office temperature INKEY$ is actually four ten-thousandths of a second quicker at jumping on and off the merry-go-round than INKEY.

I suppose you want proof. Sigh. OK. Take a look at Listing I. It starts off by getting the TIME into the variable *a* and then goes round a loop in which the INKEY$ function is evoked 500 times. Then we check the TIME again, this time putting it into the variable *b*. With me so far? Good.

So, if we subtract *a* from *b* we get the time it took, in three-hundredths of a second, for the loop to execute 500 times.

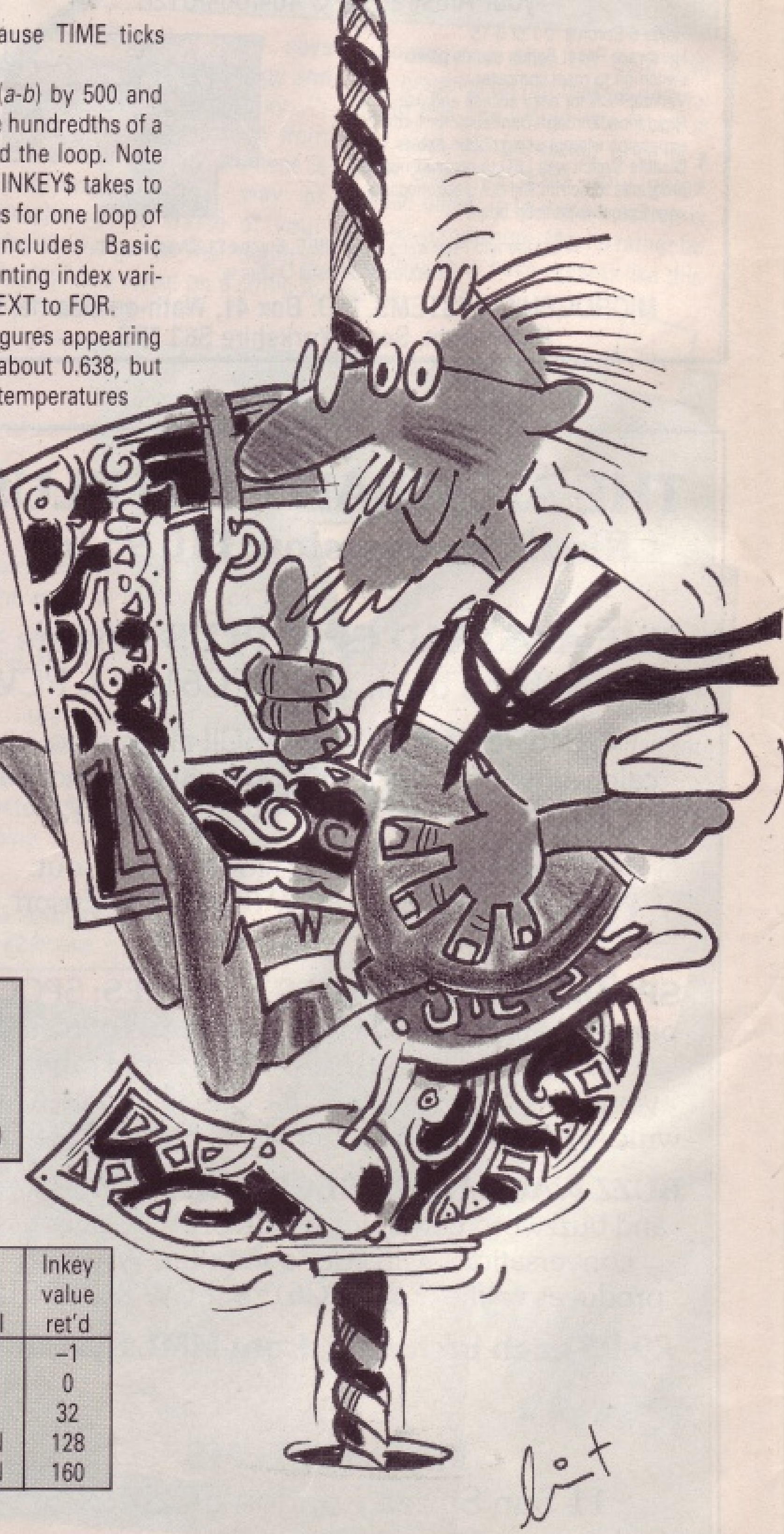
Why three-hundredths? Because TIME ticks 300 times a second, that's why.

Anyway, divide that number (*a-b*) by 500 and we are left with the time, in three hundredths of a second, it took to go once round the loop. Note that this value is not how long INKEY$ takes to execute, merely how long it takes for one loop of the loop – a loop that includes Basic housekeeping tasks like incrementing index variables and jumping back from NEXT to FOR.

Run Listing I and you'll see figures appearing on the screen. I get figures of about 0.638, but computers run slower at high temperatures so your figures might be slightly different than mine. That figure, by the way, represents 0.638 of 1/300th of a second.

Now replace line 30 of Listing I with *in=INKEY(71)* and run the program again. This time I get values of about 0.758.

Subtract 0.638 (INKEY$) from 0.758 (INKEY) and we get 0.12 of one three-hundredth of a second. The actual calculation is: 0.12 * (1/300) = 0.0004,



```
10 a=TIME
20 FOR n=1 TO 500
30 in$=INKEY$
40 NEXT
50 b=TIME
60 PRINT (b/a)/500:GOTO 10
```

Listing I

Key alone	With shift	With control	Inkey value ret'd
UP	–	–	–1
DOWN	UP	UP	0
DOWN	DOWN	UP	32
DOWN	UP	DOWN	128
DOWN	DOWN	DOWN	160

Figure I

which is four ten-thousandths of a second. Phew!

If you experiment with this little program further you'll find that INKEY$ takes longer to execute if you hold a key down (any key), and that INKEY speeds up if you hold down the correct key, but takes longer to execute if you hold down the wrong key.

Under control

Now, where was I? Ah yes, reasons to use INKEY rather than INKEY$ for detecting single keypresses. Ahem. One of the problems with INKEY$ and single keypresses is that it differentiates between upper and lower case, so you either have to check for both or use UPPER$ or LOWER$ before checking for only upper case or only lower case. However with INKEY all we need to do is check that the state of the key number value is greater than -1. If it is, it means that the key is being pressed either with Shift, with Control, with both, or on its own.

Study Listing II. Actually it is two listings illustrating the same technique using INKEY$ and INKEY. All they do is wait for the user to press Y or N, then GOSUB to subroutines at 100 and 200 to deal with these Yes or No responses. You can add the subroutines yourselves, *PRINT "Yes":RETURN* or something.

Even at a glance it is plain to see that the INKEY$ version takes slightly more programming. When you do press a key the program looks to see if it is Y or N. If you are pressing one of those keys it branches off to the relevant S/R; if you are pressing any other key, or no key at all, it loops back to the start of the line again.

The INKEY version works in the same fashion, checking for Y or N, branching or looping back. The difference here is that we can easily adjust the code to look for the use of Y or N at the same time as the Shift or Control key. No doubt you have come across commercial programs – word processors, for example – that need you to press Control and a letter key to perform a particular function; like Ctrl-H for a help page, perhaps.

To change the INKEY version to look for Ctrl-Y or Ctrl-N, all we have to do is change the bits after INKEY from *>-1* to *=128*. Try it. Try changing the code to look for Shift-Y and Shift-N. How about Ctrl-Shift-Y and Ctrl-Shift-N?

All flushed out

The small routines in Listing II are known in computer jargon as *validation loops*. Two other bits

```
1 ' Get Y or N with INKEY$
2 '
10 in$=INKEY$:IF (in$="Y" OR in$="y")
   THEN GOSUB 100 ELSE (IF in$="N" OR
   in$="n") THEN GOSUB 200 ELSE 10


1 ' Get Y or N with INKEY
2 '
10 IF INKEY(43)>-1 THEN GOSUB 100 ELSE
    IF INKEY(46)>-1 THEN GOSUB 200 ELS
   E 10
```

Listing II

Basic tutor

of computer jargon that belong in an article on INKEY are *keyboard buffer* and *flush*. Both are very simple to understand.

The keyboard buffer is a 256-byte area of memory set aside for storing all your keypresses. You must have noticed how Arnold remembers keypresses; well, this is how he does it. Arnold doesn't get your keypresses direct from the keyboard, he first puts them in the buffer and then

```
10 MODE 1
20 LOCATE 1,8
30 PRINT "Enter Filename: ";
40 legal$="ABCDEFGHIJKLMNOPQRSTUVWXYZ0
   123456789"
50 maxlen=8
60 GOSUB 1030 'inkey$ input routine
70 LOCATE 1,20
80 PRINT"You entered ";in$
90 PRINT:END
1000 '
1010 ' Inkey$ input routine.
1020 '
1030 PEN 1:PRINT CHR$(18);CHR$(143);CH
     R$(8);
1040 in$="":FOR a=1 TO maxlen+1
1050 a$="":a$=UPPER$(INKEY$):IF a$=""
     THEN 1050
1060 IF INSTR(legal$,a$)=0 AND a$<>CHR
     $(13) AND a$<>CHR$(127) THEN 1050
1070 IF (a=maxlen+1 AND a$<>CHR$(13))
     AND a$<>CHR$(127) THEN 1050
1080 IF a=1 AND a$=CHR$(13)THEN 1050 E
     LSE IF a$=CHR$(13)THEN a=maxlen+1
1090 IF a$=CHR$(127) THEN GOSUB 1150
1100 IF a$<>CHR$(127) AND a$<>CHR$(13)
     THEN GOSUB 1260
1110 NEXT:PRINT CHR$(18):RETURN
1120 '
1130 'deal with backspace
1140 '
1150 IF a=1 THEN a=0:GOTO 1220
1160 PEN 1:PRINT CHR$(8);
1170 PRINT CHR$(18);
1180 PRINT CHR$(143);
1190 PRINT CHR$(8);
1200 IF a>1 THEN a=a-2
1210 in$=LEFT$(in$,a)
1220 RETURN
1230 '
1240 'character is ok by me
1250 '
1260 PEN 2:PRINT a$;
1270 PEN 1:PRINT CHR$(143);CHR$(8);
1280 in$=in$+a$:RETURN
```

Listing III

takes them from there.

Sometimes we don't want Arnold to remember keypresses. For instance, we may want a program to halt with a "Press any key" message. But if there are yet to be processed keypresses still in the keyboard buffer, the first of these will cause the program to continue as if the user had pressed a key in response to the prompt.

What we need to do is *flush* the keyboard buffer. Or in other words, we need to tell Arnold to empty out the area of memory where he stores keypresses. 664 and 6128 owners have a Basic keyword to do this, CLEAR INPUT. But of course they can't use it if they want their program to run on a friend's 464. This is where INKEY$ comes in handy because it actually clears the buffer as it goes along. INKEY doesn't do this. You may have noticed if you ran the INKEY version of Listing II that the key you pressed appears on the screen when the program finishes. It isn't the program doing this, it's Arnold doing in public what comes naturally. INKEY$ does it in private.

So, to flush the keyboard buffer all we need to do is put an INKEY$ in a loop that says, "If the keyboard buffer isn't empty, keep asking the buffer for keypresses." The technique is very simple, and there are two ways of doing it:

```
100 IF INKEY$<>""THEN 100  'v1

100 WHILE INKEY$<>"":WEND 'v2
```

The second version is the more elegant way and says, "While the keyboard buffer isn't empty, do nothing." If, for instance, the keyboard buffer contains 20 non-processed keypresses, INKEY$ will get these one at a time and because they are not null strings, it throws them away. On the 21st look it finds a null string, says "Hey Joe, the keyboard buffer is empty" and falls out of the loop. Whenever you use INKEY$ or INKEY to get keypresses, it is always a good idea to flush the keyboard buffer first.

Home made input

Right. We'll finish this month with an INKEY$ routine that will replace the Basic INPUT command. In Listing III you can specify what keys are allowed by putting them in the string *legal$*, and you specify the maximum characters allowed to be typed in by changing the value of the variable *maxlen* in line 50.

As it stands the program accepts a maximum input of eight alphanumeric characters. The Del key is active, but the Clr and cursor keys are not.

The program uses control codes to backspace and clear characters. You can find out what CHR$(8) and CHR$(18) do by looking them up in your user manual. Can't find them? Try *Control codes* in the index.

The only other thing I'm going to say about Listing III is that 127 is the Ascii value of the "delete" character. You might like to add the cursor keys and Clr to the repertoire, in which case I'll also tell you that the Ascii for Clr is 16 and the Ascii for the four arrows are... no, you can look those up for yourselves. Tarra.

Stardodger III – the assembler version

Stewart Russell shows you how to program the same game three times in three very different languages

BCPL produced a game that would be fast enough for anyone, but was about 10k long. This seemed quite excessive, so a non-singing, non-dancing compact game in Z80 code was developed in Assembly language.

Assembly language programming is quite a different kettle of fish from Basic or BCPL, with absolutely no safety net provided for the unwary. Simple housekeeping tasks such as printing a string have to be written by the author and these can frequently prove to be the most difficult bits.

Again, the Basic Stardodger served as the template for this model, with slight differences. The screen numbers in this version are printed in hexadecimal simply because a hex routine is shorter to write than a decimal one.

Reasonable care has been taken that each routine does not corrupt registers unnecessarily. This wastes space in the form of PUSHes and POPs, but the approach is preferable to a possible system crash.

The random routine and the screen drawing routine could both be made shorter, but they work, this being of the utmost importance. Results of tests were not generally returned in registers but in memory locations, because it is all too easy to corrupt a register by mistake.

The listing was produced using the Maxam rom, so the long label names may cause problems for ADAM, Devpac, Zapp and Code Machine users, but are there to increase readability. Check your manuals to see how label names should be entered into your particular assembler.

Your reward for all of this effort? A paltry 937 bytes of code. This can be saved by hopping into Basic and typing:

```
SAVE"STARDOJ",B,&5000,&3A9,&5000
```

Some people may find this Assembler version a bit fast. Remedy this by changing part of the START subroutine from *LD A,3:CALL HAUDON* to *LD A,value:CALL HAUDON* where *value* can take any value from zero to 255 – 3 (default), 4, 5 or 6 (very slow) are the best ones to use. HAUDON, incidentally, is Glaswegian for "hold on".

Conclusions

If there has to be a conclusive winner in the general niceness stakes, BCPL would take it by a short head. It was as simple as the Basic version to write, yet ran as quickly as the Assembly version. Its only drawback was the length of the object file produced.

Producing the Assembly version was certainly challenging, but the effort involved doesn't really justify the result.

Although coming last in the race, Basic provided the slow, good-natured workhorse from which the tetchy thoroughbreds were descended.

My current record on both the BCPL and the Assembly versions is Screen 11. I've made it through Screen 19 on the Basic one. Can you get further? Go forth, and dodge them stars!



Routine	Basic lines	BCPL procs	Assembly procs
Initialisation	20-70	start	su
Print title screen	90-170	start	tiscr
Draw game screen	180-450	drawscr	drawscr1, plot
Main game logic	470-530	start	start
Print game over screen	550-600	start	losscr
Print success screen	620-680	start	wonscr
Wait for keypress routine	700-760	waitkey	waitmess, waitkey

A comparison of the main routines

```
;Stardodger by Stewart C Russell

;Standard Amsdos equates
gra_initialise equ #bbba
gra_move_abs   equ #bbc0
gra_move_rel   equ #bbc3
gra_line_rel   equ #bbf9
gra_set_pen    equ #bbde
gra_test_rel   equ #bbf3
gra_wr_char    equ #bbfc
scr_initialise equ #bbff
scr_set_ink    equ #bc32
scr_set_border equ #bc38
scr_set_mode   equ #bc0e
km_initialise  equ #bb00
km_read_key    equ #bb1b
km_test_key    equ #bb1e
txt_initialise equ #bb4e
txt_output     equ #bb5a
txt_set_cursor equ #bb75
kl_time_set    equ #bd10
kl_time_please equ #bd0d

org #5000

.start    call su              ;the game itself
          call su              ;set up colours etc.
.oloop    call tiscr           ;print title screen
.loop1    call drawscr1        ;draw screen box
          call plot            ;plot stars
          ld de,2
          ld hl,200
          call gra_move_abs  ;move to start position
.contscr  call shift           ;test if shift is pressed
          ld a,3
          call haudon          ;0.01 second delay
          ld a,(dy)            ;get result of shift test
          cp 4                 ;should it go up?
          jr nz,down           ;draw it down if it isn't
          ld hl,4
          ld de,4
          call gra_line_rel  ;draw line upwards
.doline   call test            ;have we hit anything?
          ld a,(col)           ;get result of collision test
          cp 1                 ;is it white?
          jr z,lost            ;if it is, end game.
          cp 3                 ;have we hit the gap?
          jr z,next            ;if so, go to next screen.
          jr contscr           ;continue the screen if neither.
.lost     call losscr          ;print 'you goofed' etc.
          ld a,1
          ld (scr),a           ;first screen number = 1
          ld hl,5
          ld (q),hl            ;first no of stars = 5
          ld a,4
          ld (dy),a            ;initial direction = up
          jr oloop             ;go back to start of outer loop
.next     call wonscr          ;print 'well done' etc.
          jr loop1             ;go to the next screen
.down     ld hl,-4
          ld de,4
          call gra_line_rel  ;draw line downwards
          jr doline            ;return to main loop

;draws the lines for the playing screen
.drawscr1 ld a,1
          call scr_set_mode   ;mode 1
          ld a,1
          call gra_set_pen    ;graphics pen 1
          ld de,629
          ld hl,0
          call gra_line_rel   ;drawr 629,0
          ld de,0
          ld hl,170
          call gra_line_rel   ;drawr 0,170
          ld de,0
          ld hl,60
          call gra_move_rel   ;mover 0,60
          ld de,0
          ld hl,169
          call gra_line_rel   ;drawr 0,169
          ld de,-629
          ld hl,0
          call gra_line_rel   ;drawr -629,0
          ld de,0
          ld hl,-399
          call gra_line_rel   ;drawr 0,-399
          ld de,0
          ld hl,2
          call gra_move_rel   ;mover 0,2
          ld de,627
          ld hl,0
          call gra_line_rel   ;drawr 627,0
          ld de,0
          ld hl,168
          call gra_line_rel   ;drawr 0,168
          ld de,0
          ld hl,60
          call gra_move_rel   ;mover 0,60
          ld de,0
          ld hl,167
          call gra_line_rel   ;drawr 0,167
          ld de,-625
          ld hl,0
          call gra_line_rel   ;drawr -625,0
          ld de,0
          ld hl,-399
          call gra_line_rel   ;drawr 0,-399
          ld a,3
          call gra_set_pen    ;graphics pen 3
          ld de,637
          ld hl,0
          call gra_move_abs   ;move 637,0
          ld de,0
          ld hl,400
          call gra_line_rel   ;drawr 0,400
          ld de,2
          ld hl,0
          call gra_move_rel   ;mover 2,0
          ld de,0
          ld hl,-400
          call gra_line_rel   ;draw second line at screen
          ld a,1              ;edge for completion test.
          call gra_set_pen    ;graphics pen 1
          ret

;returns A=0 and NC if no key - key no. and C if ok.
```

```
.keyvalid or a               ;clear carry flag
          call km_read_key
          ret c              ;return if we have a key
          xor a              ;clear accumulator to 0
          ret

;prints string addressed by DE at text position H,L.
;string must end with zero byte.
.prts     push af
          push hl
          push de            ;save registers
          call txt_set_cursor;set cursor to H,L
          pop de             ;get string address
.pl       ld a,(de)          ;get character
          inc de             ;increment string pointer
          or a               ;is character zero?
          jr z,pret          ;go to pret if it is
          call txt_output    ;print it
          jr pl              ;loop to start of routine
.pret     pop hl
          pop af             ;restore registers
          ret

;pauses until a key is pressed
.waitkey  push af
.w        call keyvalid      ;loop while key pressed
          jr c,w             ;to clear buffer.
.u        call keyvalid
          jr nc,u            ;loop until key pressed.
          pop af
          ret

;pauses for A/300ths of a second.
.haudon   push de
          push hl
          push af
          ld de,0
          ld hl,0
          call kl_time_set   ;reset clock
          pop af             ;get pause length
.tl       call kl_time_please;get time
          cp l               ;is it equal to value in A?
          jr nz,tl           ;loop while it isn't
          pop hl
          pop de
          ret

;get shift state and return 4 or -4 in (dy)
.shift    push af
          push hl
          push bc
          ld a,21
          call km_test_key   ;has shift been pressed?
          jr nz,yep          ;if so, go to yep
          ld a,-4
.nup      ld (dy),a          ;store value of key test
          pop bc             ;for line increment.
          pop hl
          pop af
          ret
.yep      ld a,4             ;positive line increment
          jr nup

;prints 'Press any key to continue' at 8,25
.waitmess ld hl,#0819
          ld de,paktc
          call prts
          ret

;print the title screen
.tiscr    ld a,1
          call scr_set_mode  ;mode 1
          ld hl,#1001
          ld de,sdr
          call prts          ;print title
          ld hl,#105
          ld de,avoi
          call prts          ;print instructions 1
          ld hl,#906
          ld de,wond
          call prts          ;print instructions 2
          ld hl,#c0d
          ld de,uses
          call prts          ;print key to use
          call waitmess
          call waitkey       ;wait for a keypress
          ret

;prints A in hex.
.prta     push af
          push bc
          ld b,2             ;loop counter for two nibbles
          ld c,a             ;store A
          rra
          rra
          rra
          rra
.gnyb     and #f             ;get nibble
          cp #a              ;is it >=10?
          jr nc,hex          ;if so, go to hex
          add a,#30          ;convert to ascii char 0-9
.prn      call txt_output    ;print it
          ld a,c
          djnz gnyb          ;act on lower nibble
          pop bc
          pop af
          ret
.hex      add a,#37          ;convert to ascii char a-f
          jr prn

;tests point relative (2,dy/2) and returns in (col).
.test     push bc
          push de
          push hl
          ld a,(dy)          ;get players line direction
          cp 4               ;is the line currently going up?
          jr nz,n4           ;go to n4 if it isn't
          ld hl,2            ;use relative coords (2,2) for
          ld de,2            ;test if going up.
.ctest    push hl            ;save HL
          call gra_test_rel  ;test point relative to line end
          ld (col),a         ;store ink result
          pop hl             ;restore HL
          call nhl           ;negate HL
          ld de,-2           ;move graphics cursor back
          call gra_move_rel  ;to original position.
          pop hl
          pop de
          pop bc
          ret
.n4       ld hl,-2
          ld de,2            ;use relative coords (2,-2)
          jr ctest           ;for test if going down

;negate HL
.nhl      push af
          ld a,h
          cpl
          ld h,a             ;complement H
          ld a,l
          neg
          ld l,a             ;negate L
          pop af
          ret

;prints success screen
.wonscr   ld a,1
          call scr_set_mode  ;mode 1
          ld hl,#1001
          ld de,well
          call prts          ;print 'Well Done'
```

```
         ld hl,#90d
         ld de,stan
         call prts             ;print next screen message
         ld a,(scr)            ;get next screen number
         call prta             ;print screen number in hex
         call waitmess
         call waitkey          ;press any key to continue
         ret

;prints lose screen
.losscr  ld a,1
         call scr_set_mode  ;mode 1
         ld hl,#1001
         ld de,youg
         call prts             ;print 'You Goofed'
         ld hl,#40d
         ld de,numb
         call prts             ;print number completed message
         ld a,(scr)            ;get no of next screen
         dec a
         dec a                 ;reduce it to screens completed
         call prta             ;print no of screens completed
         call waitmess
         call waitkey
         ret

;returns a psuedo-random integer in HL
.random  push af
         push bc
         ld hl,(seed)          ;get seed
         push hl               ;save it
         add hl,hl
         add hl,hl
         add hl,hl
         add hl,hl
         add hl,hl
         add hl,hl
         add hl,hl
         add hl,hl             ;HL=seed multiplied by 256
         pop bc                ;get original seed
         add hl,bc             ;add seed to (seed*256)
         ld bc,41
         add hl,bc             ;add 41 to result for fun of it
         ld a,r                ;get value of memory refresh
         add l                 ;add low byte of random result
         ld l,a                ;return this value to HL
         pop bc                ;restore BC
         adc hl,bc             ;add BC to HL (fiddle factor)
         ld (seed),hl          ;store result for later use
         pop af                ;restore AF
         ret

;remainder routine, returns HL = HL mod DE.
.rem     or a                  ;clear carry flag
         sbc hl,de             ;is DE>HL?
         add hl,de             ;restore HL
         ret c                 ;return if DE>HL
         sbc hl,de             ;HL=HL-DE(-0 in carry flag)
         jr rem                ;recurse to start

;plots the relevant number of asterisks.
;keeps track of screen no and no of stars
;in scr (byte) and q (word) respectively.
.plot    push af
         push bc
         push de
         push hl
         ld hl,(q)             ;get number of asterisks
.pltlp   push hl               ;save loop counter
         call random           ;get random number in HL
         ld de,561
         call rem              ;HL = HL mod 561
         ld de,50              ;add 50 to it to allow for
         add hl,de             ;initial reaction time.
         push hl               ;save x-coord
         call random           ;get random number for y-coord
         ld de,361
         call rem              ;HL = HL mod 361
         ld de,20
         add hl,de             ;add 20 for tidyness
         pop de
         call gra_move_abs  ;move to the random position
         ld a,"*"
         call gra_wr_char   ;and write an '*' there
         pop hl                ;get loop counter
         dec hl                ;decrement it
         ld a,h
         or l                  ;is it zero?
         jr nz,pltlp           ;loop if not
         ld a,(scr)            ;get screen no.
         inc a                 ;increment screen number
         ld (scr),a            ;restore new screen number
         ld hl,(q)             ;get number of asterisks
         inc hl
         inc hl
         inc hl
         inc hl
         inc hl
         ld (q),hl             ;set no of stars (scr*5)
         pop hl
         pop de
         pop bc
         pop af
         ret

;set up mode, colours, etc
.su      ld a,1
         call scr_set_mode  ;mode 1
         call txt_initialise
         call km_initialise
         call gra_initialise
         call scr_initialise
         xor a
         ld b,a
         ld c,a
         call scr_set_ink   ;ink 0,0
         ld a,1
         ld b,26
         ld c,b
         call scr_set_ink   ;ink 1,26
         ld a,3
         ld b,0
         ld c,b
         call scr_set_ink   ;ink 3,0
         xor a
         ld b,a
         ld c,a
         call scr_set_border;border 0
         ret

;static variables and strings

.dy      defb 4
.col     defb 0
.scr     defb 1
.paktc   defm "Press any key to continue.",0
.sdr     defm "Stardodger",0
.avoi    defm "Avoid the killer asterisks, and seek the",0
.wond    defm "wondrous Nextscreen Gap.",0
.uses    defm "Use SHIFT to climb",0
.well    defm "WELL  DONE",0
.stan    defm "Stand by for screen ",0
.youg    defm "YOU GOOFED",0
.numb    defm "Number of screens completed = ",0
.seed    defw #abcd
.q       defw 5

end
```

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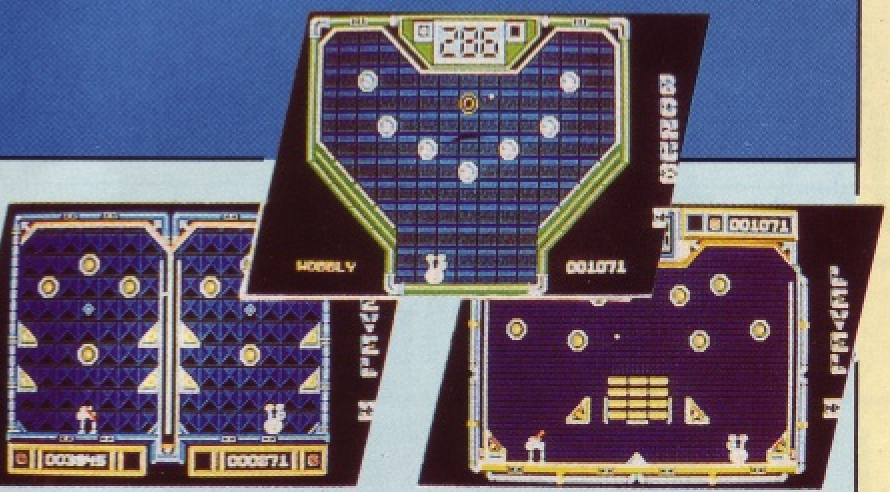
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